

$\chi_{c2}(1P)$

$I^G(J^{PC}) = 0^+(2^{++})$

See the Review on “ $\psi(2S)$ and χ_c branching ratios” before the $\chi_{c0}(1P)$ Listings.

$\chi_{c2}(1P)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
3556.20 ± 0.09 OUR AVERAGE				
3555.3 ± 0.6 ± 2.2	2.5k	UEHARA	08	BELL $\gamma\gamma \rightarrow$ hadrons
3555.70 ± 0.59 ± 0.39		ABLIKIM	05G	BES2 $\psi(2S) \rightarrow \gamma\chi_{c2}$
3556.173 ± 0.123 ± 0.020		ANDREOTTI	05A	E835 $p\bar{p} \rightarrow e^+e^-\gamma$
3559.9 ± 2.9		EISENSTEIN	01	CLE2 $e^+e^- \rightarrow e^+e^-\chi_{c2}$
3556.4 ± 0.7		BAI	99B	BES $\psi(2S) \rightarrow \gamma X$
3556.22 ± 0.131 ± 0.020	585	1 ARMSTRONG	92	E760 $\bar{p}p \rightarrow e^+e^-\gamma$
3556.9 ± 0.4 ± 0.5	50	BAGLIN	86B	SPEC $\bar{p}p \rightarrow e^+e^-X$
3557.8 ± 0.2 ± 4		2 GAISER	86	CBAL $\psi(2S) \rightarrow \gamma X$
3553.4 ± 2.2	66	3 LEMOIGNE	82	GOLI $185\pi^-Be \rightarrow \gamma\mu^+\mu^-A$
3555.9 ± 0.7		4 OREGLIA	82	CBAL $e^+e^- \rightarrow J/\psi 2\gamma$
3557 ± 1.5	69	5 HIMEL	80	MRK2 $e^+e^- \rightarrow J/\psi 2\gamma$
3551 ± 11	15	BRANDELIK	79B	DASP $e^+e^- \rightarrow J/\psi 2\gamma$
3553 ± 4		5 BARTEL	78B	CNTR $e^+e^- \rightarrow J/\psi 2\gamma$
3553 ± 4 ± 4		5,6 TANENBAUM	78	MRK1 e^+e^-
3563 ± 7	360	5 BIDDICK	77	CNTR $e^+e^- \rightarrow \gamma X$

• • • We do not use the following data for averages, fits, limits, etc. • • •

3543 ± 10 4 WHITAKER 76 MRK1 $e^+e^- \rightarrow J/\psi 2\gamma$

1 Recalculated by ANDREOTTI 05A, using the value of $\psi(2S)$ mass from AULCHENKO 03.

2 Using mass of $\psi(2S) = 3686.0$ MeV.

3 $J/\psi(1S)$ mass constrained to 3097 MeV.

4 Assuming $\psi(2S)$ mass = 3686 MeV and $J/\psi(1S)$ mass = 3097 MeV.

5 Mass value shifted by us by amount appropriate for $\psi(2S)$ mass = 3686 MeV and $J/\psi(1S)$ mass = 3097 MeV.

6 From a simultaneous fit to radiative and hadronic decay channels.

NODE=M057

NODE=M057M

NODE=M057M

NODE=M057M

$\chi_{c2}(1P)$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
1.97 ± 0.11 OUR FIT				
[1.98 ± 0.11 MeV OUR 2012 FIT]				
1.95 ± 0.13 OUR AVERAGE				
1.915 ± 0.188 ± 0.013		ANDREOTTI	05A	E835 $p\bar{p} \rightarrow e^+e^-\gamma$
1.96 ± 0.17 ± 0.07	585	7 ARMSTRONG	92	E760 $\bar{p}p \rightarrow e^+e^-\gamma$
2.6 ± 1.4 -1.0	50	BAGLIN	86B	SPEC $\bar{p}p \rightarrow e^+e^-X$
2.8 ± 2.1 -2.0		8 GAISER	86	CBAL $\psi(2S) \rightarrow \gamma X$

NODE=M057M;LINKAGE=NW

NODE=M057M;LINKAGE=C

NODE=M057M;LINKAGE=P

NODE=M057M;LINKAGE=E

NODE=M057M;LINKAGE=D

NODE=M057M;LINKAGE=M

NODE=M057W

NODE=M057W

NEW

NODE=M057W;LINKAGE=AN

NODE=M057W;LINKAGE=E

NODE=M057215;NODE=M057

$\chi_{c2}(1P)$ DECAY MODES

Mode	Fraction (Γ_i/Γ)	Confidence level
Hadronic decays		
Γ_1 $2(\pi^+\pi^-)$	(1.10 ± 0.11) %	
Γ_2 $\rho\rho$		
Γ_3 $\pi^+\pi^-\pi^0\pi^0$	(1.99 ± 0.26) %	
Γ_4 $\rho^+\pi^-\pi^0 + c.c.$	(2.4 ± 0.4) %	
Γ_5 $4\pi^0$	(1.21 ± 0.17) × 10 ⁻³	
Γ_6 $K^+K^-\pi^0\pi^0$	(2.2 ± 0.4) × 10 ⁻³	
Γ_7 $K^+\pi^-K^0\pi^0 + c.c.$	(1.50 ± 0.22) %	
Γ_8 $\rho^+K^-K^0 + c.c.$	(4.5 ± 1.4) × 10 ⁻³	

NODE=M057;CLUMP=A

DESIG=3

DESIG=43

DESIG=50

DESIG=51

DESIG=62

DESIG=52

DESIG=54

DESIG=55

Γ_9	$K^*(892)^0 K^+ \pi^- \rightarrow K^+ \pi^- K^0 \pi^0 + \text{c.c.}$	$(3.2 \pm 0.9) \times 10^{-3}$	DESIG=60
Γ_{10}	$K^*(892)^0 K^0 \pi^0 \rightarrow K^+ \pi^- K^0 \pi^0 + \text{c.c.}$	$(4.2 \pm 0.9) \times 10^{-3}$	DESIG=56
Γ_{11}	$K^*(892)^- K^+ \pi^0 \rightarrow K^+ \pi^- K^0 \pi^0 + \text{c.c.}$	$(4.0 \pm 0.9) \times 10^{-3}$	DESIG=57
Γ_{12}	$K^*(892)^+ K^0 \pi^- \rightarrow K^+ \pi^- K^0 \pi^0 + \text{c.c.}$	$(3.2 \pm 0.9) \times 10^{-3}$	DESIG=58
Γ_{13}	$K^+ K^- \eta \pi^0$	$(1.4 \pm 0.5) \times 10^{-3}$	DESIG=59
Γ_{14}	$K^+ K^- \pi^+ \pi^-$	$(9.1 \pm 1.1) \times 10^{-3}$	DESIG=5
Γ_{15}	$K^+ K^- \pi^+ \pi^- \pi^0$	$(1.3 \pm 0.4) \%$	DESIG=67
Γ_{16}	$K^+ \bar{K}^*(892)^0 \pi^- + \text{c.c.}$	$(2.3 \pm 1.2) \times 10^{-3}$	DESIG=10
Γ_{17}	$K^*(892)^0 \bar{K}^*(892)^0$	$(2.5 \pm 0.5) \times 10^{-3}$	DESIG=21
Γ_{18}	$3(\pi^+ \pi^-)$	$(8.6 \pm 1.8) \times 10^{-3}$	DESIG=4
Γ_{19}	$\phi \phi$	$(1.16 \pm 0.10) \times 10^{-3}$	DESIG=16
Γ_{20}	$\omega \omega$	$(9.2 \pm 1.1) \times 10^{-4}$	DESIG=25
Γ_{21}	$\omega \phi$		DESIG=68
Γ_{22}	$\pi \pi$	$(2.42 \pm 0.13) \times 10^{-3}$	DESIG=22
Γ_{23}	$\rho^0 \pi^+ \pi^-$	$(4.0 \pm 1.7) \times 10^{-3}$	DESIG=9
Γ_{24}	$\pi^+ \pi^- \eta$	$(5.2 \pm 1.4) \times 10^{-4}$	DESIG=39
Γ_{25}	$\pi^+ \pi^- \eta'$	$(5.4 \pm 2.0) \times 10^{-4}$	DESIG=42
Γ_{26}	$\eta \eta$	$(5.9 \pm 0.5) \times 10^{-4}$	DESIG=14
Γ_{27}	$K^+ K^-$	$(1.09 \pm 0.08) \times 10^{-3}$	DESIG=2
Γ_{28}	$K_S^0 K_S^0$	$(5.8 \pm 0.5) \times 10^{-4}$	DESIG=15
Γ_{29}	$\bar{K}^0 K^+ \pi^- + \text{c.c.}$	$(1.39 \pm 0.20) \times 10^{-3}$	DESIG=17
Γ_{30}	$K^+ K^- \pi^0$	$(3.3 \pm 0.8) \times 10^{-4}$	DESIG=36
Γ_{31}	$K^+ K^- \eta$	$< 3.5 \times 10^{-4}$	90% DESIG=40
Γ_{32}	$\eta \eta'$	$< 6 \times 10^{-5}$	90% DESIG=34
Γ_{33}	$\eta' \eta'$	$< 1.1 \times 10^{-4}$	90% DESIG=35
Γ_{34}	$\pi^+ \pi^- K_S^0 K_S^0$	$(2.4 \pm 0.6) \times 10^{-3}$	DESIG=29
Γ_{35}	$K^+ K^- \bar{K}_S^0 \bar{K}_S^0$	$< 4 \times 10^{-4}$	90% DESIG=30
Γ_{36}	$K^+ K^- K^+ K^-$	$(1.78 \pm 0.22) \times 10^{-3}$	DESIG=24
Γ_{37}	$K^+ K^- \phi$	$(1.54 \pm 0.32) \times 10^{-3}$	DESIG=32
Γ_{38}	$p \bar{p}$	$(7.1 \pm 0.4) \times 10^{-5}$	DESIG=11
Γ_{39}	$p \bar{p} \pi^0$	$(5.1 \pm 0.5) \times 10^{-4}$	DESIG=37
Γ_{40}	$p \bar{p} \eta$	$(1.89 \pm 0.28) \times 10^{-4}$	DESIG=41
Γ_{41}	$p \bar{p} \omega$	$(3.9 \pm 0.5) \times 10^{-4}$	DESIG=61
Γ_{42}	$p \bar{p} \phi$	$(3.0 \pm 1.0) \times 10^{-5}$	DESIG=66
Γ_{43}	$p \bar{p} \pi^+ \pi^-$	$(1.32 \pm 0.34) \times 10^{-3}$	DESIG=8
Γ_{44}	$p \bar{p} \pi^0 \pi^0$	$(8.5 \pm 2.6) \times 10^{-4}$	DESIG=53
Γ_{45}	$p \bar{p} K^+ K^- (\text{non-resonant})$	$(2.08 \pm 0.35) \times 10^{-4}$	DESIG=63
Γ_{46}	$p \bar{p} K_S^0 K_S^0$	$< 7.9 \times 10^{-4}$	90% DESIG=28
Γ_{47}	$p \bar{n} \pi^-$	$(1.1 \pm 0.4) \times 10^{-3}$	DESIG=31
Γ_{48}	$\Lambda \bar{\Lambda}$	$(1.86 \pm 0.27) \times 10^{-4}$	DESIG=19
Γ_{49}	$\Lambda \bar{\Lambda} \pi^+ \pi^-$	$< 3.5 \times 10^{-3}$	90% DESIG=27
Γ_{50}	$K^+ \bar{p} \Lambda + \text{c.c.}$	$(8.4 \pm 0.6) \times 10^{-4}$	DESIG=38
Γ_{51}	$K^+ p \Lambda(1520) + \text{c.c.}$	$(3.1 \pm 0.7) \times 10^{-4}$	DESIG=64
Γ_{52}	$\Lambda(1520) \bar{\Lambda}(1520)$	$(5.0 \pm 1.6) \times 10^{-4}$	DESIG=65
Γ_{53}	$\Sigma^0 \bar{\Sigma}^0$	$< 8 \times 10^{-5}$	90% DESIG=47
Γ_{54}	$\Sigma^+ \bar{\Sigma}^-$	$< 7 \times 10^{-5}$	90% DESIG=48
Γ_{55}	$\Xi^0 \bar{\Xi}^0$	$< 1.1 \times 10^{-4}$	90% DESIG=49
Γ_{56}	$\Xi^- \bar{\Xi}^+$	$(1.55 \pm 0.35) \times 10^{-4}$	DESIG=26
Γ_{57}	$J/\psi(1S) \pi^+ \pi^- \pi^0$	$< 1.5 \% \quad 90\%$	DESIG=12
Γ_{58}	$\eta_c(1S) \pi^+ \pi^-$	$< 2.3 \% \quad 90\%$	DESIG=69

Radiative decays

Γ_{59}	$\gamma J/\psi(1S)$	$(19.8 \pm 0.8) \%$	NODE=M057;CLUMP=B
Γ_{60}	$\gamma \rho^0$	$< 2.1 \times 10^{-5}$	90% DESIG=44
Γ_{61}	$\gamma \omega$	$< 6 \times 10^{-6}$	90% DESIG=45
Γ_{62}	$\gamma \phi$	$< 8 \times 10^{-6}$	90% DESIG=46
Γ_{63}	$\gamma \gamma$	$(2.61 \pm 0.16) \times 10^{-4}$	DESIG=7

CONSTRAINED FIT INFORMATION

A multiparticle fit to $\chi_{c1}(1P)$, $\chi_{c0}(1P)$, $\chi_{c2}(1P)$, and $\psi(2S)$ with 4 total widths, a partial width, 25 combinations of partial widths obtained from integrated cross section, and 84 branching ratios uses 227 measurements to determine 49 parameters. The overall fit has a $\chi^2 = 325.4$ for 178 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients $\langle \delta p_i \delta p_j \rangle / (\delta p_i \delta p_j)$, in percent, from the fit to parameters p_i , including the branching fractions, $x_i \equiv \Gamma_i / \Gamma_{\text{total}}$.

x_{14}	17									
x_{16}	4	22								
x_{17}	10	8	2							
x_{19}	18	15	3	9						
x_{22}	24	20	4	12	29					
x_{23}	20	4	1	2	4	5				
x_{26}	14	12	3	7	17	32	3			
x_{27}	18	16	3	9	22	39	4	24		
x_{28}	17	15	3	9	20	34	4	21	25	
x_{29}	9	8	2	5	11	19	2	12	14	12
x_{36}	12	10	2	6	13	22	3	13	16	14
x_{38}	7	5	1	3	4	1	2	0	1	2
x_{48}	8	7	2	4	11	19	2	12	14	13
x_{59}	29	25	5	15	34	61	6	37	45	40
x_{63}	-17	-14	-3	-8	-9	2	-5	2	0	-3
Γ	-25	-21	-5	-12	-25	-36	-6	-22	-28	-25
	x_1	x_{14}	x_{16}	x_{17}	x_{19}	x_{22}	x_{23}	x_{26}	x_{27}	x_{28}
x_{36}	8									
x_{38}	1	2								
x_{48}	7	8	0							
x_{59}	22	26	-10	23						
x_{63}	0	-3	29	1	8					
Γ	-14	-17	-50	-13	-50	-50				
	x_{29}	x_{36}	x_{38}	x_{48}	x_{59}	x_{63}				

$\chi_{c2}(1P)$ PARTIAL WIDTHS

$$\text{--- } \chi_{c2}(1P) \Gamma(i) \Gamma(\gamma J/\psi(1S)) / \Gamma(\text{total}) \text{ ---}$$

$$\Gamma(p\bar{p}) \times \Gamma(\gamma J/\psi(1S)) / \Gamma_{\text{total}} \qquad \qquad \qquad \Gamma_{38}\Gamma_{59}/\Gamma$$

VALUE (eV)	DOCUMENT ID	TECN	COMMENT
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27.8±1.4 OUR FIT

[27.7 ± 1.4 eV OUR 2012 FIT]

27.5±1.5 OUR AVERAGE

$27.0 \pm 1.5 \pm 1.1$	⁹ ANDREOTTI 05A E835	$p\bar{p} \rightarrow e^+ e^- \gamma$
$27.7 \pm 1.5 \pm 2.0$	^{9,10} ARMSTRONG 92 E760	$\bar{p}p \rightarrow e^+ e^- \gamma$
36 ± 8	⁹ BAGLIN 86B SPEC	$\bar{p}p \rightarrow e^+ e^- X$

⁹ Calculated by us using $B(J/\psi(1S) \rightarrow e^+ e^-) = 0.0593 \pm 0.0010$.

¹⁰ Recalculated by ANDREOTTI 05A.

NODE=M057220

NODE=M057223

NODE=M057G1

NODE=M057G1

NEW

NODE=M057G;LINKAGE=7A

NODE=M057G;LINKAGE=AN

$$\Gamma(\gamma\gamma) \times \Gamma(\gamma J/\psi(1S)) / \Gamma_{\text{total}} \qquad \qquad \qquad \Gamma_{63}\Gamma_{59}/\Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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102± 6 OUR FIT

[100 ± 6 eV OUR 2012 FIT]

117± 10 OUR AVERAGE

$111 \pm 12 \pm 9$	147 ± 15	¹¹ DOBBS	06 CLE3	$10.4 e^+ e^- \rightarrow e^+ e^- \chi_{c2}$
$114 \pm 11 \pm 9$	136 ± 13.3	^{11,12} ABE	02T BELL	$e^+ e^- \rightarrow e^+ e^- \chi_{c2}$
$139 \pm 55 \pm 21$		^{11,13} ACCIARRI	99E L3	$e^+ e^- \rightarrow e^+ e^- \chi_{c2}$

NODE=M057G2

NODE=M057G2

NEW

$242 \pm 65 \pm 51$	$11,14$	ACKER..,K...	98	OPAL	$e^+ e^- \rightarrow e^+ e^- \chi_{c2}$
$150 \pm 42 \pm 36$	$11,15$	DOMINICK	94	CLE2	$e^+ e^- \rightarrow e^+ e^- \chi_{c2}$
$470 \pm 240 \pm 120$	$11,16$	BAUER	93	TPC	$e^+ e^- \rightarrow e^+ e^- \chi_{c2}$

11 Calculated by us using $B(J/\psi \rightarrow \ell^+ \ell^-) = 0.1187 \pm 0.0008$.

12 All systematic errors added in quadrature.

13 The value for $\Gamma(\chi_{c2} \rightarrow \gamma\gamma)$ reported in ACCIARRI 99E is derived using $B(\chi_{c2} \rightarrow \gamma J/\psi(1S)) \times B(J/\psi(1S) \rightarrow \ell^+ \ell^-) = 0.0162 \pm 0.0014$.

14 The value for $\Gamma(\chi_{c2} \rightarrow \gamma\gamma)$ reported in ACKERSTAFF,K 98 is derived using $B(\chi_{c2} \rightarrow \gamma J/\psi(1S)) = 0.135 \pm 0.011$ and $B(J/\psi(1S) \rightarrow \ell^+ \ell^-) = 0.1203 \pm 0.0038$.

15 The value for $\Gamma(\chi_{c2} \rightarrow \gamma\gamma)$ reported in DOMINICK 94 is derived using $B(\chi_{c2} \rightarrow \gamma J/\psi(1S)) = 0.135 \pm 0.011$, $B(J/\psi(1S) \rightarrow e^+ e^-) = 0.0627 \pm 0.0020$, and $B(J/\psi(1S) \rightarrow \mu^+ \mu^-) = 0.0597 \pm 0.0025$.

16 The value for $\Gamma(\chi_{c2} \rightarrow \gamma\gamma)$ reported in BAUER 93 is derived using $B(\chi_{c2} \rightarrow \gamma J/\psi(1S)) = 0.135 \pm 0.011$, $B(J/\psi(1S) \rightarrow e^+ e^-) = 0.0627 \pm 0.0020$, and $B(J/\psi(1S) \rightarrow \mu^+ \mu^-) = 0.0597 \pm 0.0025$.

$\chi_{c2}(1P) \Gamma(i)\Gamma(\gamma\gamma)/\Gamma(\text{total})$

$\Gamma(2(\pi^+\pi^-)) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT	$\Gamma_1\Gamma_{63}/\Gamma$
5.7 ± 0.5 OUR FIT [5.6 ± 0.5 eV OUR 2012 FIT]					
5.2 ± 0.7 OUR AVERAGE					

$\Gamma(\rho\rho) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$

VALUE (eV)	CL%	EVTS	DOCUMENT ID	TECN	COMMENT	$\Gamma_2\Gamma_{63}/\Gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •						

$\Gamma(K^+ K^- \pi^+ \pi^-) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT	$\Gamma_{14}\Gamma_{63}/\Gamma$
4.7 ± 0.5 OUR FIT					

$\Gamma(4.42 \pm 0.42 \pm 0.53) 780 \pm 74$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
UEHARA 08 BELL $\gamma\gamma \rightarrow \chi_{c2} \rightarrow K^+ K^- \pi^+ \pi^-$				

$\Gamma(K^+ K^- \pi^+ \pi^- \pi^0) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT	$\Gamma_{15}\Gamma_{63}/\Gamma$
6.5 ± 0.9 ± 1.5	1250	DEL-AMO-SA..11M	BABR	$\gamma\gamma \rightarrow K^+ K^- \pi^+ \pi^- \pi^0$	

$\Gamma(K^*(892)^0 \bar{K}^*(892)^0) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT	$\Gamma_{17}\Gamma_{63}/\Gamma$
1.26 ± 0.24 OUR FIT					

$\Gamma(0.8 \pm 0.17 \pm 0.27) 151 \pm 30$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
UEHARA 08 BELL $\gamma\gamma \rightarrow \chi_{c2} \rightarrow K^+ K^- \pi^+ \pi^-$				

$\Gamma(\phi\phi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT	$\Gamma_{19}\Gamma_{63}/\Gamma$
0.59 ± 0.05 OUR FIT [0.58 ± 0.06 eV OUR 2012 FIT]					

$\Gamma(0.62 \pm 0.09 \text{ OUR AVERAGE}) [0.58 \pm 0.24 \text{ eV OUR 2012 AVERAGE}]$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
0.62 ± 0.07 ± 0.05	89 ± 11	17 LIU	12B BELL	$\gamma\gamma \rightarrow 2(K^+ K^-)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$\Gamma(0.58 \pm 0.18 \pm 0.16) 26.5 \pm 8.1$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
UEHARA 08 BELL $\gamma\gamma \rightarrow \chi_{c2} \rightarrow 2(K^+ K^-)$				

17 Supersedes UEHARA 08. Using $B(\phi \rightarrow K^+ K^-) = (48.9 \pm 0.5)\%$.

$\Gamma(\omega\omega) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT	$\Gamma_{20}\Gamma_{63}/\Gamma$
0.62 ± 0.07 ± 0.05	89 ± 11	18 LIU	12B BELL	$\gamma\gamma \rightarrow 2(\pi^+ \pi^- \pi^0)$	

18 Using $B(\omega \rightarrow \pi^+ \pi^- \pi^0) = (89.2 \pm 0.7)\%$.

$\Gamma(\omega\phi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT	$\Gamma_{21}\Gamma_{63}/\Gamma$
0.62 ± 0.07 ± 0.05	89 ± 11	19 LIU	12B BELL	$\gamma\gamma \rightarrow K^+ K^- \pi^+ \pi^- \pi^0$	

19 Using $B(\phi \rightarrow K^+ K^-) = (48.9 \pm 0.5)\%$ and $B(\omega \rightarrow \pi^+ \pi^- \pi^0) = (89.2 \pm 0.7)\%$.

NODE=M057G;LINKAGE=LL

NODE=M057G;LINKAGE=GT

NODE=M057G;LINKAGE=J4

NODE=M057G;LINKAGE=J5

NODE=M057G;LINKAGE=J6

NODE=M057224

NODE=M057G3

NODE=M057G3

NEW

NODE=M057G08

NODE=M057G08

NODE=M057G09

NODE=M057G09

NODE=M057G02

NODE=M057G02

NODE=M057G10

NODE=M057G10

NODE=M057G12

NODE=M057G12

NEW

NEW

NODE=M057G12;LINKAGE=LI

NODE=M057G03

NODE=M057G03

NODE=M057G03;LINKAGE=LI

NODE=M057G04

NODE=M057G04

NODE=M057G04;LINKAGE=LI

$\Gamma(\pi\pi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$	$\Gamma_{22}\Gamma_{63}/\Gamma$			
VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
1.24±0.08 OUR FIT				
1.18±0.25 OUR AVERAGE				
1.44±0.54±0.47	34 ± 13	20 UEHARA	09 BELL	$10.6 e^+ e^- \rightarrow e^+ e^- \pi^0 \pi^0$
1.14±0.21±0.17	54 ± 10	21 NAKAZAWA	05 BELL	$10.6 e^+ e^- \rightarrow e^+ e^- \pi^+ \pi^-$
20 We multiplied the measurement by 3 to convert from $\pi^0 \pi^0$ to $\pi\pi$. Interference with the continuum included.				
21 We have multiplied $\pi^+ \pi^-$ measurement by 3/2 to obtain $\pi\pi$.				
$\Gamma(\rho^0 \pi^+ \pi^-) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$	$\Gamma_{23}\Gamma_{63}/\Gamma$			
VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
2.0±0.9 OUR FIT				
3.2±1.9±0.5	986 ± 578	UEHARA	08 BELL	$\gamma\gamma \rightarrow \chi_{c2} \rightarrow 2(\pi^+ \pi^-)$
$\Gamma(\eta\eta) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$	$\Gamma_{26}\Gamma_{63}/\Gamma$			
VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
0.53±0.22±0.09	8	22 UEHARA	10A BELL	$10.6 e^+ e^- \rightarrow e^+ e^- \eta\eta$
22 Interference with the continuum not included.				
$\Gamma(K^+ K^-) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$	$\Gamma_{27}\Gamma_{63}/\Gamma$			
VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
0.56±0.04 OUR FIT				
[0.56 ± 0.05 eV OUR 2012 FIT]				
0.44±0.11±0.07	33 ± 8	NAKAZAWA	05 BELL	$10.6 e^+ e^- \rightarrow e^+ e^- K^+ K^-$
$\Gamma(K_S^0 K_S^0) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$	$\Gamma_{28}\Gamma_{63}/\Gamma$			
VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
0.297±0.025 OUR FIT				
[0.297 ± 0.026 eV OUR 2012 FIT]				
0.31 ± 0.05 ± 0.03	38 ± 7	CHEN	07B BELL	$e^+ e^- \rightarrow e^+ e^- \chi_{c2}$
$\Gamma(\bar{K}^0 K^+ \pi^- + \text{c.c.}) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$	$\Gamma_{29}\Gamma_{63}/\Gamma$			
VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
0.71±0.11 OUR FIT				
[0.72 ± 0.11 eV OUR 2012 FIT]				
1.20±0.33±0.13	126	23 DEL-AMO-SA..11M BABR	$\gamma\gamma \rightarrow K_S^0 K^\pm \pi^\mp$	
23 We have multiplied $\bar{K}K\pi$ by 2/3 to obtain $\bar{K}^0 K^+ \pi^- + \text{c.c.}$				
$\Gamma(K^+ K^- K^+ K^-) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$	$\Gamma_{36}\Gamma_{63}/\Gamma$			
VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
0.91±0.12 OUR FIT				
1.10±0.21±0.15	126 ± 24	UEHARA	08 BELL	$\gamma\gamma \rightarrow \chi_{c2} \rightarrow 2(K^+ K^-)$
$\Gamma(\eta_c(1S)\pi^+ \pi^-) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$	$\Gamma_{58}\Gamma_{63}/\Gamma$			
VALUE (eV)	CL\%	DOCUMENT ID	TECN	COMMENT
<15.7	90	LEES	12AE BABR	$e^+ e^- \rightarrow e^+ e^- \pi^+ \pi^- \eta_c$

$\chi_{c2}(1P)$ BRANCHING RATIOS

— HADRONIC DECAYS —

$\Gamma(2(\pi^+ \pi^-))/\Gamma_{\text{total}}$	Γ_1/Γ
VALUE	DOCUMENT ID
0.0110±0.0011 OUR FIT	
0.36±0.15 OUR FIT	
0.31±0.17	
$\Gamma(\rho^0 \pi^+ \pi^-)/\Gamma(2(\pi^+ \pi^-))$	Γ_{23}/Γ_1
VALUE	DOCUMENT ID
0.36±0.15 OUR FIT	
0.31±0.17	TANENBAUM 78 MRK1 $\psi(2S) \rightarrow \gamma \chi_{c2}$

NODE=M057G4
NODE=M057G4

NODE=M057G4;LINKAGE=UE
NODE=M057G;LINKAGE=NA

NODE=M057G07
NODE=M057G07

NODE=M057G13
NODE=M057G13

NODE=M057G13;LINKAGE=UE
NODE=M057G5
NODE=M057G5
NEW

NODE=M057G6
NODE=M057G6
NEW

NODE=M057G01
NODE=M057G01
NEW

NODE=M057G01;LINKAGE=DE

NODE=M057G11
NODE=M057G11

NODE=M057G05
NODE=M057G05

NODE=M057225
NODE=M057305
NODE=M057R2
NODE=M057R2

NODE=M057R38
NODE=M057R38

$\Gamma(\pi^+\pi^-\pi^0\pi^0)/\Gamma_{\text{total}}$					Γ_3/Γ
VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT	
1.99±0.26 OUR AVERAGE	[(2.00 ± 0.26)% OUR 2012 AVERAGE]				
1.99±0.25±0.08	903.5	24 HE	08B CLEO	$e^+e^- \rightarrow \gamma h^+h^-h^0h^0$	
24 HE 08B reports $1.87 \pm 0.07 \pm 0.22 \pm 0.13$ % from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow \pi^+\pi^-\pi^0\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.					

$\Gamma(\rho^+\pi^-\pi^0+c.c.)/\Gamma_{\text{total}}$					Γ_4/Γ
VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT	
2.4±0.4±0.1	1031.9	25,26 HE	08B CLEO	$e^+e^- \rightarrow \gamma h^+h^-h^0h^0$	
25 HE 08B reports $2.23 \pm 0.11 \pm 0.32 \pm 0.16$ % from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow \rho^+\pi^-\pi^0+c.c.)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.					
26 Calculated by us. We have added the values from HE 08B for $\rho^+\pi^-\pi^0$ and $\rho^-\pi^+\pi^0$ decays assuming uncorrelated statistical and fully correlated systematic uncertainties.					

$\Gamma(4\pi^0)/\Gamma_{\text{total}}$					Γ_5/Γ
VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT	
1.21±0.16±0.05	1164	27 ABLIKIM	11A BES3	$e^+e^- \rightarrow \psi(2S) \rightarrow \gamma\chi_{c2}$	
27 ABLIKIM 11A reports $(1.21 \pm 0.05 \pm 0.16) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow 4\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.74 \pm 0.35) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.					

$\Gamma(K^+K^-\pi^0\pi^0)/\Gamma_{\text{total}}$					Γ_6/Γ
VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT	
0.22±0.04 OUR AVERAGE	[(0.22 ± 0.05)% OUR 2012 AVERAGE]				
0.22±0.04±0.01	76.9	28 HE	08B CLEO	$e^+e^- \rightarrow \gamma h^+h^-h^0h^0$	
28 HE 08B reports $0.21 \pm 0.03 \pm 0.03 \pm 0.01$ % from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow K^+K^-\pi^0\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.					

$\Gamma(K^+\pi^-K^0\pi^0+c.c.)/\Gamma_{\text{total}}$					Γ_7/Γ
VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT	
1.50±0.22 OUR AVERAGE	[(1.51 ± 0.22)% OUR 2012 AVERAGE]				
1.50±0.21±0.06	211.6	29 HE	08B CLEO	$e^+e^- \rightarrow \gamma h^+h^-h^0h^0$	
29 HE 08B reports $1.41 \pm 0.11 \pm 0.16 \pm 0.10$ % from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow K^+\pi^-K^0\pi^0+c.c.)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.					

$\Gamma(\rho^+K^-K^0+c.c.)/\Gamma_{\text{total}}$					Γ_8/Γ
VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT	
0.45±0.13±0.02	62.9	30 HE	08B CLEO	$e^+e^- \rightarrow \gamma h^+h^-h^0h^0$	
30 HE 08B reports $0.42 \pm 0.11 \pm 0.06 \pm 0.03$ % from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow \rho^+K^-K^0+c.c.)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.					

NODE=M057R46

NODE=M057R46

NEW

NODE=M057R46;LINKAGE=HE

NODE=M057R47

NODE=M057R47

NODE=M057R47;LINKAGE=HE

NODE=M057R58

NODE=M057R58

NODE=M057R58;LINKAGE=AB

NODE=M057R48

NODE=M057R48

NODE=M057R48;LINKAGE=HE

NODE=M057R50

NODE=M057R50

NEW

NODE=M057R50;LINKAGE=HE

NODE=M057R51

NODE=M057R51

NODE=M057R51;LINKAGE=HE

$\Gamma(K^*(892)^0 K^+ \pi^- \rightarrow K^+ \pi^- K^0 \pi^0 + c.c.)/\Gamma_{\text{total}}$

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT	Γ_9/Γ
0.32±0.09±0.01	38.7	31 HE	08B CLEO	$e^+ e^- \rightarrow \gamma h^+ h^- h^0 h^0$	

31 HE 08B reports $0.30 \pm 0.07 \pm 0.04 \pm 0.02$ % from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow K^*(892)^0 K^+ \pi^- \rightarrow K^+ \pi^- K^0 \pi^0 + c.c.)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

 $\Gamma(K^*(892)^0 K^0 \pi^0 \rightarrow K^+ \pi^- K^0 \pi^0 + c.c.)/\Gamma_{\text{total}}$

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT	Γ_{10}/Γ
0.42±0.09±0.02	63.0	32 HE	08B CLEO	$e^+ e^- \rightarrow \gamma h^+ h^- h^0 h^0$	

32 HE 08B reports $0.39 \pm 0.07 \pm 0.05 \pm 0.03$ % from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow K^*(892)^0 K^0 \pi^0 \rightarrow K^+ \pi^- K^0 \pi^0 + c.c.)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

 $\Gamma(K^*(892)^- K^+ \pi^0 \rightarrow K^+ \pi^- K^0 \pi^0 + c.c.)/\Gamma_{\text{total}}$

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT	Γ_{11}/Γ
0.40±0.09 OUR AVERAGE				$[(0.41 \pm 0.09)\% \text{ OUR 2012 AVERAGE}]$	

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT	Γ_{11}/Γ
0.40±0.09±0.02	51.1	33 HE	08B CLEO	$e^+ e^- \rightarrow \gamma h^+ h^- h^0 h^0$	

33 HE 08B reports $0.38 \pm 0.07 \pm 0.04 \pm 0.03$ % from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow K^*(892)^- K^+ \pi^0 \rightarrow K^+ \pi^- K^0 \pi^0 + c.c.)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

 $\Gamma(K^*(892)^+ K^0 \pi^- \rightarrow K^+ \pi^- K^0 \pi^0 + c.c.)/\Gamma_{\text{total}}$

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT	Γ_{12}/Γ
0.32±0.09±0.01	39.3	34 HE	08B CLEO	$e^+ e^- \rightarrow \gamma h^+ h^- h^0 h^0$	

34 HE 08B reports $0.30 \pm 0.07 \pm 0.04 \pm 0.02$ % from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow K^*(892)^+ K^0 \pi^- \rightarrow K^+ \pi^- K^0 \pi^0 + c.c.)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

 $\Gamma(K^+ K^- \eta \pi^0)/\Gamma_{\text{total}}$

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT	Γ_{13}/Γ
0.14±0.05±0.01	22.9	35 HE	08B CLEO	$e^+ e^- \rightarrow \gamma h^+ h^- h^0 h^0$	

35 HE 08B reports $0.13 \pm 0.04 \pm 0.02 \pm 0.01$ % from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow K^+ K^- \eta \pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

 $\Gamma(K^+ K^- \pi^+ \pi^-)/\Gamma_{\text{total}}$

VALUE (units 10^{-3})	DOCUMENT ID	Γ_{14}/Γ
9.1±1.1 OUR FIT		

 $\Gamma(K^+ \bar{K}^*(892)^0 \pi^- + c.c.)/\Gamma(K^+ K^- \pi^+ \pi^-)$

VALUE	DOCUMENT ID	TECN	COMMENT	Γ_{16}/Γ_{14}
0.25±0.13 OUR FIT				
0.25±0.13	TANENBAUM 78	MRK1	$\psi(2S) \rightarrow \gamma \chi_{c2}$	

 $\Gamma(K^+ \bar{K}^*(892)^0 \pi^- + c.c.)/\Gamma_{\text{total}}$

VALUE (units 10^{-4})	DOCUMENT ID	Γ_{16}/Γ
23±12 OUR FIT		

 $\Gamma(K^*(892)^0 \bar{K}^*(892)^0)/\Gamma_{\text{total}}$

VALUE (units 10^{-3})	DOCUMENT ID	Γ_{17}/Γ
2.5±0.5 OUR FIT		

NODE=M057R57

NODE=M057R57

NODE=M057R57;LINKAGE=HE

NODE=M057R52

NODE=M057R52

NODE=M057R52;LINKAGE=HE

NODE=M057R53

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NODE=M057R53;LINKAGE=HE

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NODE=M057R55

NODE=M057R55;LINKAGE=HE

NODE=M057R3

NODE=M057R3

NODE=M057R39

NODE=M057R39

NODE=M057R9

NODE=M057R9

NODE=M057R26

NODE=M057R26

$\Gamma(3(\pi^+\pi^-))/\Gamma_{\text{total}}$

<u>VALUE (units 10^{-3})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	Γ_{18}/Γ
8.6±1.8 OUR EVALUATION			Treating systematic error as correlated.	
8.6±1.8 OUR AVERAGE				
$8.6 \pm 0.9 \pm 1.6$	36 BAI	99B BES	$\psi(2S) \rightarrow \gamma \chi_{c2}$	
$8.7 \pm 5.9 \pm 0.4$	36 TANENBAUM	78 MRK1	$\psi(2S) \rightarrow \gamma \chi_{c2}$	
36 Rescaled by us using $B(\psi(2S) \rightarrow \gamma \chi_{c2}) = (8.3 \pm 0.4)\%$ and $B(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-) = (32.6 \pm 0.5)\%$. Multiplied by a factor of 2 to convert from $K_S^0 K^+ \pi^-$ to $K^0 K^+ \pi^-$ decay.				

 $\Gamma(\phi\phi)/\Gamma_{\text{total}}$

<u>VALUE (units 10^{-3})</u>	<u>DOCUMENT ID</u>	Γ_{19}/Γ
1.16±0.10 OUR FIT [(1.14 ± 0.12) $\times 10^{-3}$ OUR 2012 FIT]		

 $\Gamma(\omega\omega)/\Gamma_{\text{total}}$

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	Γ_{20}/Γ
0.92±0.11 OUR AVERAGE					
$0.89 \pm 0.11 \pm 0.03$	762	37 ABLIKIM	11K BES3	$\psi(2S) \rightarrow \gamma$ hadrons	
$1.9 \pm 0.6 \pm 0.1$	27.7 ± 7.4	38 ABLIKIM	05N BES2	$\psi(2S) \rightarrow \gamma \chi_{c2} \rightarrow \gamma 6\pi$	
37 ABLIKIM 11K reports $(8.9 \pm 0.3 \pm 1.1) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow \omega\omega)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = (8.74 \pm 0.35) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.					NODE=M057R28;LINKAGE=AL
38 ABLIKIM 05N reports $[\Gamma(\chi_{c2}(1P) \rightarrow \omega\omega)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P))]$ = $(0.165 \pm 0.044 \pm 0.032) \times 10^{-3}$ which we divide by our best value $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.					NODE=M057R28;LINKAGE=AB

 $\Gamma(\omega\phi)/\Gamma_{\text{total}}$

<u>VALUE (units 10^{-5})</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	Γ_{21}/Γ
<2.0	90	39 ABLIKIM	11K BES3	$\psi(2S) \rightarrow \gamma$ hadrons	
39 ABLIKIM 11K reports $< 2 \times 10^{-5}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow \omega\phi)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = (8.74 \pm 0.35) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = 8.76 \times 10^{-2}$.					NODE=M057R63;LINKAGE=AL

 $\Gamma(\pi\pi)/\Gamma_{\text{total}}$

<u>VALUE (units 10^{-3})</u>	<u>DOCUMENT ID</u>	Γ_{22}/Γ
2.42±0.13 OUR FIT [(2.43 ± 0.13) $\times 10^{-3}$ OUR 2012 FIT]		

 $\Gamma(\rho^0\pi^+\pi^-)/\Gamma_{\text{total}}$

<u>VALUE (units 10^{-4})</u>	<u>DOCUMENT ID</u>	Γ_{23}/Γ
40±17 OUR FIT		

 $\Gamma(\pi^+\pi^-\eta)/\Gamma_{\text{total}}$

<u>VALUE (units 10^{-3})</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	Γ_{24}/Γ
0.52±0.14±0.02	40 ATHAR	07 CLEO	$\psi(2S) \rightarrow \gamma h^+ h^- h^0$		
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<1.6	90	41 ABLIKIM	06R BES2	$\psi(2S) \rightarrow \gamma \chi_{c2}$	
40 ATHAR 07 reports $(0.49 \pm 0.12 \pm 0.06) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow \pi^+\pi^-\eta)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.					NODE=M057R08;LINKAGE=AT
41 ABLIKIM 06R reports $< 1.7 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow \pi^+\pi^-\eta)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = (8.1 \pm 0.4) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = 8.76 \times 10^{-2}$.					NODE=M057R08;LINKAGE=AB

NODE=M057R4

NODE=M057R4

→ UNCHECKED ←

NODE=M057R;LINKAGE=X3

NODE=M057R20

NODE=M057R20

NEW

NODE=M057R28

NODE=M057R28

NODE=M057R28;LINKAGE=AL

NODE=M057R28;LINKAGE=AB

NODE=M057R63

NODE=M057R63

NODE=M057R63;LINKAGE=AL

NODE=M057R27

NODE=M057R27

NEW

NODE=M057R8

NODE=M057R8

NODE=M057R08

NODE=M057R08

NODE=M057R08;LINKAGE=AB

$\Gamma(\pi^+\pi^-\eta')/\Gamma_{\text{total}}$

<u>VALUE</u> (units 10^{-3})	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	Γ_{25}/Γ
0.54±0.20 OUR AVERAGE	$[(0.55 \pm 0.20) \times 10^{-3}$ OUR 2012 AVERAGE]			
0.54±0.20±0.02	42 ATHAR	07 CLEO	$\psi(2S) \rightarrow \gamma h^+ h^- h^0$	

42 ATHAR 07 reports $(0.51 \pm 0.18 \pm 0.06) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow \pi^+\pi^-\eta')/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))] \text{ assuming } B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

NODE=M057R35
NODE=M057R35

NEW

NODE=M057R35;LINKAGE=AT

 $\Gamma(\eta\eta)/\Gamma_{\text{total}}$

<u>VALUE</u> (units 10^{-4})	<u>DOCUMENT ID</u>	Γ_{26}/Γ
5.9±0.5 OUR FIT		

NODE=M057R16
NODE=M057R16 $\Gamma(K^+K^-)/\Gamma_{\text{total}}$

<u>VALUE</u> (units 10^{-3})	<u>DOCUMENT ID</u>	Γ_{27}/Γ
1.09±0.08 OUR FIT		

NODE=M057R11
NODE=M057R11 $\Gamma(K_S^0 K_S^0)/\Gamma_{\text{total}}$

<u>VALUE</u> (units 10^{-3})	<u>DOCUMENT ID</u>	Γ_{28}/Γ
0.58±0.05 OUR FIT		

NODE=M057R19
NODE=M057R19 $\Gamma(K_S^0 K_S^0)/\Gamma(\pi\pi)$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	Γ_{28}/Γ_{22}
0.239±0.019 OUR FIT				

• • • We do not use the following data for averages, fits, limits, etc. • • •

0.27 ± 0.07 ± 0.04 43,44 CHEN 07B BELL $e^+e^- \rightarrow e^+e^-\chi_{c2}$ 43 Using $\Gamma(\pi\pi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ from the $\pi^+\pi^-$ measurement of NAKAZAWA 05 rescaled by 3/2 to convert to $\pi\pi$.

44 Not independent from other measurements.

 $\Gamma(K_S^0 K_S^0)/\Gamma(K^+K^-)$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	Γ_{28}/Γ_{27}
0.53±0.05 OUR FIT				

NODE=M057R37
NODE=M057R37

• • • We do not use the following data for averages, fits, limits, etc. • • •

0.70±0.21±0.12 45,46 CHEN 07B BELL $e^+e^- \rightarrow e^+e^-\chi_{c2}$ 45 Using $\Gamma(K^+K^-) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ from NAKAZAWA 05.

46 Not independent from other measurements.

 $\Gamma(K^+K^-\pi^0)/\Gamma_{\text{total}}$

<u>VALUE</u> (units 10^{-3})	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	Γ_{30}/Γ
0.33±0.08±0.01	47 ATHAR	07 CLEO	$\psi(2S) \rightarrow \gamma h^+ h^- h^0$	

NODE=M057R37;LINKAGE=CH
NODE=M057R37;LINKAGE=NI47 ATHAR 07 reports $(0.31 \pm 0.07 \pm 0.04) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow K^+K^-\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))] \text{ assuming } B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.NODE=M057R05
NODE=M057R05

NODE=M057R05;LINKAGE=AT

 $\Gamma(K^+K^-\eta)/\Gamma_{\text{total}}$

<u>VALUE</u> (units 10^{-3})	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	Γ_{31}/Γ
<0.35	90	48 ATHAR	07 CLEO	$\psi(2S) \rightarrow \gamma h^+ h^- h^0$	

NODE=M057R09
NODE=M057R0948 ATHAR 07 reports $< 0.33 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow K^+K^-\eta)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))] \text{ assuming } B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = 8.76 \times 10^{-2}$.

NODE=M057R09;LINKAGE=AT

 $\Gamma(\eta\eta')/\Gamma_{\text{total}}$

<u>VALUE</u> (units 10^{-4})	<u>CL%</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	Γ_{32}/Γ
<0.6	90	3.3 ± 8.0	49 ASNER	09 CLEO	$\psi(2S) \rightarrow \gamma\eta\eta'$	

NODE=M057R03
NODE=M057R03

• • • We do not use the following data for averages, fits, limits, etc. • • •

<2.5 90 50 ADAMS 07 CLEO $\psi(2S) \rightarrow \gamma\chi_{c2}$

49 ASNER 09 reports $< 0.6 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow \eta\eta')/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = 8.76 \times 10^{-2}$.

50 Superseded by ASNER 09. ADAMS 07 reports $< 2.3 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow \eta\eta')/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = 0.0933 \pm 0.0014 \pm 0.0061$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = 8.76 \times 10^{-2}$.

$\Gamma(\eta'\eta')/\Gamma_{\text{total}}$		Γ_{33}/Γ			
VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
<1.1	90	12 ± 7	51 ASNER	09 CLEO	$\psi(2S) \rightarrow \gamma\eta'\eta'$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<3.3	90	52 ADAMS	07 CLEO	$\psi(2S) \rightarrow \gamma\chi_{c2}$	
51 ASNER 09 reports $< 1.0 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow \eta'\eta')/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = 8.76 \times 10^{-2}$.					
52	Superseded by ASNER 09. ADAMS 07 reports $< 3.1 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow \eta'\eta')/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = 0.0933 \pm 0.0014 \pm 0.0061$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = 8.76 \times 10^{-2}$.				

$\Gamma(\pi^+\pi^- K_S^0 K_S^0)/\Gamma_{\text{total}}$		Γ_{34}/Γ			
VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT	
2.4±0.6±0.1	57 ± 11	53 ABLIKIM	050 BES2	$\psi(2S) \rightarrow \gamma\chi_{c2}$	

53 ABLIKIM 050 reports $[\Gamma(\chi_{c2}(1P) \rightarrow \pi^+\pi^- K_S^0 K_S^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))] = (0.207 \pm 0.039 \pm 0.033) \times 10^{-3}$ which we divide by our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(K^+K^- K_S^0 K_S^0)/\Gamma_{\text{total}}$		Γ_{35}/Γ			
VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
<4	90	2.3 ± 2.2	54 ABLIKIM	050 BES2	$e^+e^- \rightarrow \chi_{c2}\gamma$
54 ABLIKIM 050 reports $[\Gamma(\chi_{c2}(1P) \rightarrow K^+K^- K_S^0 K_S^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))] < 3.5 \times 10^{-5}$ which we divide by our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = 8.76 \times 10^{-2}$.					

$\Gamma(K^+K^- K^+K^-)/\Gamma_{\text{total}}$		Γ_{36}/Γ			
VALUE (units 10^{-3})	DOCUMENT ID				
1.78±0.22 OUR FIT					

$\Gamma(K^+K^-\phi)/\Gamma_{\text{total}}$		Γ_{37}/Γ			
VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT	
1.54±0.32 OUR AVERAGE	$[(1.55 \pm 0.33) \times 10^{-3}$ OUR 2012 AVERAGE]				
1.54±0.32±0.06	52	55 ABLIKIM	06T BES2	$\psi(2S) \rightarrow \gamma K^+K^-$	
55 ABLIKIM 06T reports $(1.67 \pm 0.26 \pm 0.24) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow K^+K^-\phi)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.1 \pm 0.4) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.					

$\Gamma(p\bar{p})/\Gamma_{\text{total}}$		Γ_{38}/Γ			
VALUE (units 10^{-4})	DOCUMENT ID				
0.71±0.04 OUR FIT					
$[(0.72 \pm 0.04) \times 10^{-4}$ OUR 2012 FIT]					

$\Gamma(p\bar{p}\pi^0)/\Gamma_{\text{total}}$		Γ_{39}/Γ			
VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT		
0.51±0.05 OUR AVERAGE					
0.51±0.04±0.02	56 ONYISI	10 CLE3	$\psi(2S) \rightarrow \gamma p\bar{p}X$		
0.47±0.10±0.02	57 ATHAR	07 CLEO	$\psi(2S) \rightarrow \gamma h^+h^-h^0$		

NODE=M057R03;LINKAGE=AS

NODE=M057R03;LINKAGE=AD

NODE=M057R04
NODE=M057R04

NODE=M057R31;LINKAGE=AB

NODE=M057R32;LINKAGE=AB

NODE=M057R01;LINKAGE=AB

NODE=M057R12
NODE=M057R12

NEW

NODE=M057R06
NODE=M057R06

56 ONYISI 10 reports $(4.83 \pm 0.25 \pm 0.35 \pm 0.31) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow p\bar{p}\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

57 ATHAR 07 reports $(0.44 \pm 0.08 \pm 0.05) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow p\bar{p}\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(p\bar{p}\eta)/\Gamma_{\text{total}}$	Γ_{40}/Γ			
VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT	
0.189±0.028 OUR AVERAGE [(0.190 ± 0.028) × 10 ⁻³ OUR 2012 AVERAGE]				

0.188 ± 0.028 ± 0.007	58 ONYISI	10 CLE3	$\psi(2S) \rightarrow \gamma p\bar{p}X$	
0.20 ± 0.08 ± 0.01	59 ATHAR	07 CLEO	$\psi(2S) \rightarrow \gamma h^+ h^- h^0$	

58 ONYISI 10 reports $(1.76 \pm 0.23 \pm 0.14 \pm 0.11) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow p\bar{p}\eta)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

59 ATHAR 07 reports $(0.19 \pm 0.07 \pm 0.02) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow p\bar{p}\eta)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(p\bar{p}\omega)/\Gamma_{\text{total}}$	Γ_{41}/Γ			
VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT	
0.39±0.05±0.02	60 ONYISI	10 CLE3	$\psi(2S) \rightarrow \gamma p\bar{p}X$	

60 ONYISI 10 reports $(3.68 \pm 0.35 \pm 0.26 \pm 0.24) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow p\bar{p}\omega)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(p\bar{p}\phi)/\Gamma_{\text{total}}$	Γ_{42}/Γ			
VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
3.0±0.9±0.1	24 ± 7	61 ABLIKIM	11F BES3	$\psi(2S) \rightarrow \gamma p\bar{p}K^+ K^-$

61 ABLIKIM 11F reports $(3.04 \pm 0.85 \pm 0.43) \times 10^{-5}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow p\bar{p}\phi)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.74 \pm 0.35) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(p\bar{p}\pi^+\pi^-)/\Gamma_{\text{total}}$	Γ_{43}/Γ			
VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT	
1.32±0.34 OUR EVALUATION Treating systematic error as correlated.				

1.3 ± 0.4 OUR AVERAGE Error includes scale factor of 1.3.				
1.17 ± 0.19 ± 0.30	62 BAI	99B BES	$\psi(2S) \rightarrow \gamma\chi_{c2}$	
2.64 ± 1.03 ± 0.14	62 TANENBAUM	78 MRK1	$\psi(2S) \rightarrow \gamma\chi_{c2}$	

62 Rescaled by us using $B(\psi(2S) \rightarrow \gamma\chi_{c2}) = (8.3 \pm 0.4)\%$ and $B(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-) = (32.6 \pm 0.5)\%$. Multiplied by a factor of 2 to convert from $K_S^0 K^+ \pi^-$ to $K^0 K^+ \pi^-$ decay.

$\Gamma(p\bar{p}\pi^0\pi^0)/\Gamma_{\text{total}}$	Γ_{44}/Γ			
VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT
0.085±0.026 OUR AVERAGE [(0.086 ± 0.026)% OUR 2012 AVERAGE]				

0.085±0.025±0.003 29.2	63 HE	08B CLEO	$e^+ e^- \rightarrow \gamma h^+ h^- h^0 h^0$	
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63 HE 08B reports $0.08 \pm 0.02 \pm 0.01 \pm 0.01$ % from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow p\bar{p}\pi^0\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

NODE=M057R06;LINKAGE=ON

NODE=M057R06;LINKAGE=AT

NODE=M057R34
NODE=M057R34
NEW

NODE=M057R34;LINKAGE=ON

NODE=M057R34;LINKAGE=AT

NODE=M057R56
NODE=M057R56

NODE=M057R56;LINKAGE=ON

NODE=M057R62
NODE=M057R62

NODE=M057R62;LINKAGE=AB

NODE=M057R6;LINKAGE=X3

NODE=M057R49
NODE=M057R49
NEW

NODE=M057R49;LINKAGE=HE

$\Gamma(p\bar{p}K^+K^-(\text{non-resonant}))/\Gamma_{\text{total}}$					Γ_{45}/Γ
<u>VALUE (units 10^{-4})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
2.08±0.35 OUR AVERAGE		$[(2.1 \pm 0.4) \times 10^{-4}$ OUR 2012 AVERAGE]			
2.08±0.34±0.08	131 ± 12	64 ABLIKIM	11F BES3	$\psi(2S) \rightarrow \gamma p\bar{p}K^+K^-$	

64 ABLIKIM 11F reports $(2.08 \pm 0.19 \pm 0.30) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow p\bar{p}K^+K^-(\text{non-resonant}))/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))] \text{ assuming } B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.74 \pm 0.35) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(p\bar{p}K_S^0 K_S^0)/\Gamma_{\text{total}}$					Γ_{46}/Γ
<u>VALUE (units 10^{-4})</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
<7.9	90	65 ABLIKIM	06D BES2	$\psi(2S) \rightarrow \chi_{c2}\gamma$	

65 Using $B(\psi(2S) \rightarrow \chi_{c2}\gamma) = (9.3 \pm 0.6)\%$.

$\Gamma(p\bar{n}\pi^-)/\Gamma_{\text{total}}$					Γ_{47}/Γ
<u>VALUE (units 10^{-4})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
11.1±3.7±0.4	66 ABLIKIM	06I BES2	$\psi(2S) \rightarrow \gamma p\pi^- X$		

66 ABLIKIM 06I reports $[\Gamma(\chi_{c2}(1P) \rightarrow p\bar{n}\pi^-)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))] = (0.97 \pm 0.20 \pm 0.26) \times 10^{-4}$ which we divide by our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\Lambda\bar{\Lambda})/\Gamma_{\text{total}}$					Γ_{48}/Γ
<u>VALUE (units 10^{-4})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
1.86±0.27 OUR FIT					

$\Gamma(\Lambda\bar{\Lambda}\pi^+\pi^-)/\Gamma_{\text{total}}$					Γ_{49}/Γ
<u>VALUE (units 10^{-3})</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
<3.5	90	67 ABLIKIM	06D BES2	$\psi(2S) \rightarrow \chi_{c2}\gamma$	

67 Using $B(\psi(2S) \rightarrow \chi_{c2}\gamma) = (9.3 \pm 0.6)\%$.

$\Gamma(K^+\bar{p}\Lambda + \text{c.c.})/\Gamma_{\text{total}}$					Γ_{50}/Γ
<u>VALUE (units 10^{-4})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
8.4±0.6 OUR AVERAGE		$[(0.91 \pm 0.18) \times 10^{-3}$ OUR 2012 AVERAGE]			
$8.4 \pm 0.6 \pm 0.3$	5k 68,69 ABLIKIM	13D BES3	$\psi(2S) \rightarrow \gamma\Lambda\bar{p}K^+$		
$9.1 \pm 1.7 \pm 0.4$	70 ATHAR	07 CLEO	$\psi(2S) \rightarrow \gamma h^+ h^- h^0$		

68 ABLIKIM 13D reports $(8.4 \pm 0.3 \pm 0.6) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow K^+\bar{p}\Lambda + \text{c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))] \text{ assuming } B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.72 \pm 0.34) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

69 Using $B(\Lambda \rightarrow p\pi^-) = 63.9\%$.

70 ATHAR 07 reports $(8.5 \pm 1.4 \pm 1.0) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow K^+\bar{p}\Lambda + \text{c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))] \text{ assuming } B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(K^+\bar{p}\Lambda(1520)+\text{c.c.})/\Gamma_{\text{total}}$					Γ_{51}/Γ
<u>VALUE (units 10^{-4})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
3.1±0.7±0.1	79 ± 13	71 ABLIKIM	11F BES3	$\psi(2S) \rightarrow \gamma p\bar{p}K^+K^-$	

71 ABLIKIM 11F reports $(3.06 \pm 0.50 \pm 0.54) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow K^+\bar{p}\Lambda(1520)+\text{c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))] \text{ assuming } B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.74 \pm 0.35) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

NODE=M057R59

NODE=M057R59

NEW

NODE=M057R59;LINKAGE=AB

NODE=M057R30

NODE=M057R30

NODE=M057R;LINKAGE=AB

NODE=M057R33

NODE=M057R33

NODE=M057R33;LINKAGE=AB

NODE=M057R25

NODE=M057R25

NODE=M057R29

NODE=M057R29

NODE=M057R29;LINKAGE=AB

NODE=M057R07

NODE=M057R07

NEW

NODE=M057R07;LINKAGE=LB

NODE=M057R07;LINKAGE=AT

NODE=M057R60

NODE=M057R60

NODE=M057R60;LINKAGE=AB

$\Gamma(\Lambda(1520)\bar{\Lambda}(1520))/\Gamma_{\text{total}}$	Γ_{52}/Γ
<u>VALUE (units 10^{-4})</u>	<u>EVTS</u> <u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>
5.0±1.6 OUR AVERAGE $[(5.1 \pm 1.6) \times 10^{-4}$ OUR 2012 AVERAGE]	
5.0±1.6±0.2 29 ± 7 72 ABLIKIM 11F BES3 $\psi(2S) \rightarrow \gamma p\bar{p} K^+ K^-$	

72 ABLIKIM 11F reports $(5.05 \pm 1.29 \pm 0.93) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow \Lambda(1520)\bar{\Lambda}(1520))/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.74 \pm 0.35) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\Sigma^0\bar{\Sigma}^0)/\Gamma_{\text{total}}$	Γ_{53}/Γ
<u>VALUE (units 10^{-4})</u>	<u>CL%</u> <u>EVTS</u> <u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>
<0.8 90 7.5 ± 3.4	73 NAIK 08 CLEO $\psi(2S) \rightarrow \gamma\Sigma^0\bar{\Sigma}^0$

73 NAIK 08 reports $< 0.75 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow \Sigma^0\bar{\Sigma}^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = 8.76 \times 10^{-2}$.

$\Gamma(\Sigma^+\bar{\Sigma}^-)/\Gamma_{\text{total}}$	Γ_{54}/Γ
<u>VALUE (units 10^{-4})</u>	<u>CL%</u> <u>EVTS</u> <u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>
<0.7 90 4.0 ± 3.5	74 NAIK 08 CLEO $\psi(2S) \rightarrow \gamma\Sigma^+\bar{\Sigma}^-$

74 NAIK 08 reports $< 0.67 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow \Sigma^+\bar{\Sigma}^-)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = 8.76 \times 10^{-2}$.

$\Gamma(\Xi^0\bar{\Xi}^0)/\Gamma_{\text{total}}$	Γ_{55}/Γ
<u>VALUE (units 10^{-4})</u>	<u>CL%</u> <u>EVTS</u> <u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>
<1.1 90 2.9 ± 1.7	75 NAIK 08 CLEO $\psi(2S) \rightarrow \gamma\Xi^0\bar{\Xi}^0$

75 NAIK 08 reports $< 1.06 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow \Xi^0\bar{\Xi}^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = 8.76 \times 10^{-2}$.

$\Gamma(\Xi^-\bar{\Xi}^+)/\Gamma_{\text{total}}$	Γ_{56}/Γ
<u>VALUE (units 10^{-4})</u>	<u>CL%</u> <u>EVTS</u> <u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>
1.55±0.34±0.06 29 ± 5	76 NAIK 08 CLEO $\psi(2S) \rightarrow \gamma\Xi^-\bar{\Xi}^+$
• • • We do not use the following data for averages, fits, limits, etc. • • •	
< 3.7 90	77 ABLIKIM 06D BES2 $\psi(2S) \rightarrow \chi_{c2}\gamma$

76 NAIK 08 reports $(1.45 \pm 0.30 \pm 0.15) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow \Xi^-\bar{\Xi}^+)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.76 \pm 0.34) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

77 Using $B(\psi(2S) \rightarrow \chi_{c2}\gamma) = (9.3 \pm 0.6)\%$.

$\Gamma(J/\psi(1S)\pi^+\pi^-\pi^0)/\Gamma_{\text{total}}$	Γ_{57}/Γ
<u>VALUE</u>	<u>CL%</u> <u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>
<0.015	90 BARATE 81 SPEC 190 GeV $\pi^- \text{Be} \rightarrow 2\pi 2\mu$

$\Gamma(\eta_c(1S)\pi^+\pi^-)/\Gamma(K^0 K^+ \pi^- + \text{c.c.})$	Γ_{58}/Γ_{29}
<u>VALUE</u>	<u>CL%</u> <u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>
<16.4	90 78 LEES 12AE BABR $e^+ e^- \rightarrow e^+ e^- \pi^+ \pi^- \eta_c$

78 We divided the reported limit by 2 to take into account the $K_L^0 K^+ \pi^-$ mode.

———— RADIATIVE DECAYS ——

$\Gamma(\gamma J/\psi(1S))/\Gamma_{\text{total}}$	Γ_{59}/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>
0.198±0.008 OUR FIT [0.195 ± 0.008 OUR 2012 FIT]	
• • • We do not use the following data for averages, fits, limits, etc. • • •	
0.199±0.005±0.012	79 ADAM 05A CLEO $e^+ e^- \rightarrow \psi(2S) \rightarrow \gamma\chi_{c2}$

79 Uses $B(\psi(2S) \rightarrow \gamma\chi_{c2} \rightarrow \gamma\gamma J/\psi)$ from ADAM 05A and $B(\psi(2S) \rightarrow \gamma\chi_{c2})$ from ATHAR 04.

NODE=M057R61

NODE=M057R61

NEW

NODE=M057R61;LINKAGE=AB

NODE=M057R43
NODE=M057R43

NODE=M057R43;LINKAGE=NA

NODE=M057R44
NODE=M057R44

NODE=M057R44;LINKAGE=NA

NODE=M057R45
NODE=M057R45

NODE=M057R45;LINKAGE=NA

NODE=M057R17
NODE=M057R17

NODE=M057R17;LINKAGE=NA

NODE=M057R17;LINKAGE=AB

NODE=M057R13
NODE=M057R13NODE=M057R64
NODE=M057R64

NODE=M057R64;LINKAGE=LE

NODE=M057310

NODE=M057R7
NODE=M057R7

NEW

NODE=M057R7;LINKAGE=AD

$\Gamma(\gamma\rho^0)/\Gamma_{\text{total}}$						Γ_{60}/Γ
<u>VALUE (units 10^{-6})</u>	<u>CL%</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
<21	90	13 ± 11	80 ABLIKIM	11E BES3	$\psi(2S) \rightarrow \gamma\gamma\rho^0$	
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$						
<50	90	17.2 ± 6.8	81 BENNETT	08A CLEO	$\psi(2S) \rightarrow \gamma\gamma\rho^0$	
80 ABLIKIM 11E reports $< 20.8 \times 10^{-6}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow \gamma\rho^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.74 \pm 0.35) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = 8.76 \times 10^{-2}$.						NODE=M057R40;LINKAGE=AB
81 BENNETT 08A reports $< 50 \times 10^{-6}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow \gamma\rho^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.1 \pm 0.4) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = 8.76 \times 10^{-2}$.						NODE=M057R40;LINKAGE=BE
$\Gamma(\gamma\omega)/\Gamma_{\text{total}}$						Γ_{61}/Γ
<u>VALUE (units 10^{-6})</u>	<u>CL%</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
<6	90	1 ± 6	82 ABLIKIM	11E BES3	$\psi(2S) \rightarrow \gamma\gamma\omega$	
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$						
<6	90	0.0 ± 1.8	83 BENNETT	08A CLEO	$\psi(2S) \rightarrow \gamma\gamma\omega$	
82 ABLIKIM 11E reports $< 6.1 \times 10^{-6}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow \gamma\omega)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.74 \pm 0.35) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = 8.76 \times 10^{-2}$.						NODE=M057R41;LINKAGE=AB
83 BENNETT 08A reports $< 7.0 \times 10^{-6}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow \gamma\omega)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.1 \pm 0.4) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = 8.76 \times 10^{-2}$.						NODE=M057R41;LINKAGE=BE
$\Gamma(\gamma\phi)/\Gamma_{\text{total}}$						Γ_{62}/Γ
<u>VALUE (units 10^{-6})</u>	<u>CL%</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
< 8	90	5 ± 5	84 ABLIKIM	11E BES3	$\psi(2S) \rightarrow \gamma\gamma\phi$	
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$						
<12	90	1.3 ± 2.5	85 BENNETT	08A CLEO	$\psi(2S) \rightarrow \gamma\gamma\phi$	
84 ABLIKIM 11E reports $< 8.1 \times 10^{-6}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow \gamma\phi)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.74 \pm 0.35) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = 8.76 \times 10^{-2}$.						NODE=M057R42;LINKAGE=AB
85 BENNETT 08A reports $< 13 \times 10^{-6}$ from a measurement of $[\Gamma(\chi_{c2}(1P) \rightarrow \gamma\phi)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = (8.1 \pm 0.4) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c2}(1P)) = 8.76 \times 10^{-2}$.						NODE=M057R42;LINKAGE=BE
$\Gamma(\gamma\gamma)/\Gamma_{\text{total}}$						Γ_{63}/Γ
<u>VALUE (units 10^{-4})</u>		<u>DOCUMENT ID</u>				
2.61±0.16 OUR FIT						
$[(2.59 \pm 0.16) \times 10^{-4}$ OUR 2012 FIT]						
$\Gamma(\gamma\gamma)/\Gamma(\gamma J/\psi(1S))$						Γ_{63}/Γ_{59}
<u>VALUE (units 10^{-3})</u>		<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
1.31±0.09 OUR FIT						
$[(1.33 \pm 0.09) \times 10^{-3}$ OUR 2012 FIT]						
0.99±0.18		86 AMBROGIANI 00B E835	$\bar{p}p \rightarrow \chi_{c2} \rightarrow \gamma\gamma, \gamma J/\psi$			
86 Calculated by us using $B(J/\psi(1S) \rightarrow e^+e^-) = 0.0593 \pm 0.0010$.						
$\Gamma(\gamma\gamma)/\Gamma_{\text{total}} \times \Gamma(p\bar{p})/\Gamma_{\text{total}}$						$\Gamma_{63}/\Gamma \times \Gamma_{38}/\Gamma$
<u>VALUE (units 10^{-8})</u>		<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
1.85±0.18 OUR FIT						
$[(1.86 \pm 0.18) \times 10^{-8}$ OUR 2012 FIT]						
1.7 ± 0.4 OUR AVERAGE						
1.60±0.42		ARMSTRONG 93 E760	$\bar{p}p \rightarrow \gamma\gamma X$			
9.9 ± 4.5		BAGLIN 87B SPEC	$\bar{p}p \rightarrow \gamma\gamma X$			

$\chi_{c2}(1P)$ CROSS-PARTICLE BRANCHING RATIOS

$$\frac{\Gamma(\chi_{c2}(1P) \rightarrow K^+ K^- \pi^+ \pi^-) / \Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) / \Gamma(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-)}{\Gamma_{14} / \Gamma \times \Gamma_{120}^{\psi(2S)} / \Gamma_{11}^{\psi(2S)}}$$

VALUE (units 10^{-3}) DOCUMENT ID TECN COMMENT

2.35±0.26 OUR FIT

$[(2.36 \pm 0.27) \times 10^{-3}$ OUR 2012 FIT]

2.5 ±0.9 OUR AVERAGE Error includes scale factor of 2.3.

1.90 $\pm 0.14 \pm 0.44$	BAI	99B	BES	$\psi(2S) \rightarrow \gamma \chi_{c2}$
3.8 ± 0.67	87	TANENBAUM	78	MRK1 $\psi(2S) \rightarrow \gamma \chi_{c2}$

87 The reported value is derived using $B(\psi(2S) \rightarrow \pi^+ \pi^- J/\psi) \times B(J/\psi \rightarrow \ell^+ \ell^-) = (4.6 \pm 0.7)\%$. Calculated by us using $B(J/\psi \rightarrow \ell^+ \ell^-) = 0.1181 \pm 0.0020$.

$$\frac{\Gamma(\chi_{c2}(1P) \rightarrow K^*(892)^0 \bar{K}^*(892)^0) / \Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) / \Gamma_{\text{total}}}{\Gamma_{17} / \Gamma \times \Gamma_{120}^{\psi(2S)} / \Gamma_{11}^{\psi(2S)}}$$

VALUE (units 10^{-4}) DOCUMENT ID TECN COMMENT

2.2 ±0.4 OUR FIT

3.11±0.36±0.48

ABLIKIM 04H BES2 $\psi(2S) \rightarrow \gamma \chi_{c2}$

$$\frac{\Gamma(\chi_{c2}(1P) \rightarrow p \bar{p}) / \Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) / \Gamma(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-)}{\Gamma_{38} / \Gamma \times \Gamma_{120}^{\psi(2S)} / \Gamma_{11}^{\psi(2S)}}$$

VALUE (units 10^{-5}) DOCUMENT ID TECN COMMENT

1.83±0.13 OUR FIT

$[(1.86 \pm 0.14) \times 10^{-5}$ OUR 2012 FIT]

1.4 ±1.1	88	BAI	98I	BES $\psi(2S) \rightarrow \gamma \chi_{c2} \rightarrow \gamma \bar{p} p$
-----------------	----	-----	-----	--

88 Calculated by us. The value for $B(\chi_{c2} \rightarrow p \bar{p})$ reported in BAI 98I is derived using $B(\psi(2S) \rightarrow \gamma \chi_{c2}) = (7.8 \pm 0.8)\%$ and $B(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-) = (32.4 \pm 2.6)\%$ [BAI 98D].

$$\frac{\Gamma(\chi_{c2}(1P) \rightarrow p \bar{p}) / \Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) / \Gamma_{\text{total}}}{\Gamma_{38} / \Gamma \times \Gamma_{120}^{\psi(2S)} / \Gamma_{11}^{\psi(2S)}}$$

VALUE (units 10^{-6}) EVTS DOCUMENT ID TECN COMMENT

6.2±0.5 OUR FIT

$[(6.3 \pm 0.5) \times 10^{-6}$ OUR 2012 FIT]

6.7±1.1 OUR AVERAGE Error includes scale factor of 1.5.

7.2 $\pm 0.7 \pm 0.4$	121 ± 12	89	NAIK	08 CLEO $\psi(2S) \rightarrow \gamma p \bar{p}$
4.4 ± 1.6	14.3 ± 5.2	BAI	04F	BES $\psi(2S) \rightarrow \gamma \chi_{c2}(1P) \rightarrow \gamma \bar{p} p$

89 Calculated by us. NAIK 08 reports $B(\chi_{c2} \rightarrow p \bar{p}) = (7.7 \pm 0.8 \pm 0.4 \pm 0.5) \times 10^{-5}$ using $B(\psi(2S) \rightarrow \gamma \chi_{c2}) = (9.33 \pm 0.14 \pm 0.61)\%$.

$$\frac{\Gamma(\chi_{c2}(1P) \rightarrow \Lambda \bar{\Lambda}) / \Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) / \Gamma_{\text{total}}}{\Gamma_{48} / \Gamma \times \Gamma_{120}^{\psi(2S)} / \Gamma_{11}^{\psi(2S)}}$$

VALUE (units 10^{-6}) EVTS DOCUMENT ID TECN COMMENT

16.3±2.3 OUR FIT

15.9±2.1±1.0 71 ± 9 90 NAIK 08 CLEO $\psi(2S) \rightarrow \gamma \Lambda \bar{\Lambda}$

90 Calculated by us. NAIK 08 reports $B(\chi_{c2} \rightarrow \Lambda \bar{\Lambda}) = (17.0 \pm 2.2 \pm 1.1 \pm 1.1) \times 10^{-5}$ using $B(\psi(2S) \rightarrow \gamma \chi_{c2}) = (9.33 \pm 0.14 \pm 0.61)\%$.

$$\frac{\Gamma(\chi_{c2}(1P) \rightarrow \Lambda \bar{\Lambda}) / \Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) / \Gamma(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-)}{\Gamma_{48} / \Gamma \times \Gamma_{120}^{\psi(2S)} / \Gamma_{11}^{\psi(2S)}}$$

VALUE (units 10^{-5}) EVTS DOCUMENT ID TECN COMMENT

4.8±0.7 OUR FIT

7.1 $^{+3.1}_{-2.9}$ ±1.3 8.3 $^{+3.7}_{-3.4}$ 91 BAI 03E BES $\psi(2S) \rightarrow \gamma \Lambda \bar{\Lambda}$

91 BAI 03E reports $[B(\chi_{c2} \rightarrow \Lambda \bar{\Lambda}) B(\psi(2S) \rightarrow \gamma \chi_{c2}) / B(\psi(2S) \rightarrow J/\psi \pi^+ \pi^-)] \times [B^2(\Lambda \rightarrow \pi^- p) / B(J/\psi \rightarrow p \bar{p})] = (1.33^{+0.59}_{-0.55} \pm 0.25)\%$. We calculate from this measurement the presented value using $B(\Lambda \rightarrow \pi^- p) = (63.9 \pm 0.5)\%$ and $B(J/\psi \rightarrow p \bar{p}) = (2.17 \pm 0.07) \times 10^{-3}$.

NODE=M057230

NODE=M057B18

NODE=M057B18

NEW

NODE=M057B18;LINKAGE=TA

NODE=M057B19

NODE=M057B19

NODE=M057B1

NODE=M057B1

NEW

NODE=M057B;LINKAGE=J8

NODE=M057B6

NODE=M057B6

NEW

NODE=M057B6;LINKAGE=NA

NODE=M057B10

NODE=M057B10

NODE=M057B10;LINKAGE=NA

NODE=M057B11

NODE=M057B11

NODE=M057B11;LINKAGE=BA

$$\Gamma(\chi_{c2}(1P) \rightarrow \pi\pi)/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))/\Gamma_{\text{total}}$$

$$\Gamma_{22}/\Gamma \times \Gamma_{120}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}$$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
2.12±0.08 OUR FIT				
$[(2.11 \pm 0.08) \times 10^{-4}$ OUR 2012 FIT]				
2.17±0.09 OUR AVERAGE				
2.19±0.05±0.15	4.5k	92 ABLIKIM	10A BES3	$e^+ e^- \rightarrow \psi(2S) \rightarrow \gamma\chi_{c2}$
2.23±0.06±0.10	2.5k	93 ASNER	09 CLEO	$\psi(2S) \rightarrow \gamma\pi^+\pi^-$
1.90±0.08±0.20	0.8k	94 ASNER	09 CLEO	$\psi(2S) \rightarrow \gamma\pi^0\pi^0$
92 Calculated by us. ABLIKIM 10A reports $B(\chi_{c2} \rightarrow \pi^0\pi^0) = (0.88 \pm 0.02 \pm 0.06 \pm 0.04) \times 10^{-3}$ using $B(\psi(2S) \rightarrow \gamma\chi_{c2}) = (8.3 \pm 0.4)\%$. We have multiplied the $\pi^0\pi^0$ measurement by 3 to obtain $\pi\pi$.				
93 Calculated by us. ASNER 09 reports $B(\chi_{c2} \rightarrow \pi^+\pi^-) = (1.59 \pm 0.04 \pm 0.07 \pm 0.10) \times 10^{-3}$ using $B(\psi(2S) \rightarrow \gamma\chi_{c2}) = (9.33 \pm 0.14 \pm 0.61)\%$. We have multiplied the $\pi^+\pi^-$ measurement by 3/2 to obtain $\pi\pi$.				
94 Calculated by us. ASNER 09 reports $B(\chi_{c2} \rightarrow \pi^0\pi^0) = (0.68 \pm 0.03 \pm 0.07 \pm 0.04) \times 10^{-3}$ using $B(\psi(2S) \rightarrow \gamma\chi_{c2}) = (9.33 \pm 0.14 \pm 0.61)\%$. We have multiplied the $\pi^0\pi^0$ measurement by 3 to obtain $\pi\pi$.				

NODE=M057B02
NODE=M057B02
NEW

OCCUR=2
NODE=M057B02;LINKAGE=AB
NODE=M057B02;LINKAGE=AS
NODE=M057B02;LINKAGE=AN

$$\Gamma(\chi_{c2}(1P) \rightarrow \pi\pi)/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))/\Gamma(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-)$$

$$\Gamma_{22}/\Gamma \times \Gamma_{120}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}$$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
0.622±0.024 OUR FIT				
$[(0.629 \pm 0.024) \times 10^{-3}$ OUR 2012 FIT]				
0.54 ±0.06 OUR AVERAGE				
0.66 ±0.18 ±0.37	21 ± 6	95 BAI	03C BES	$\psi(2S) \rightarrow \gamma\pi^0\pi^0$
0.54 ±0.05 ±0.04	185 ± 16	96 BAI	98I BES	$\psi(2S) \rightarrow \gamma\pi^+\pi^-$
95 We have multiplied $\pi^0\pi^0$ measurement by 3 to obtain $\pi\pi$.				
96 Calculated by us. The value for $B(\chi_{c2} \rightarrow \pi^+\pi^-)$ reported by BAI 98I is derived using $B(\psi(2S) \rightarrow \gamma\chi_{c2}) = (7.8 \pm 0.8)\%$ and $B(\psi(2S) \rightarrow J/\psi\pi^+\pi^-) = (32.4 \pm 2.6)\%$ [BAI 98D]. We have multiplied $\pi^+\pi^-$ measurement by 3/2 to obtain $\pi\pi$.				

NODE=M057B9
NODE=M057B9
NEW

NODE=M057B;LINKAGE=BM
NODE=M057B;LINKAGE=BA

$$\Gamma(\chi_{c2}(1P) \rightarrow \eta\eta)/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))/\Gamma_{\text{total}}$$

$$\Gamma_{26}/\Gamma \times \Gamma_{120}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}$$

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
0.52±0.04 OUR FIT					
0.52±0.04 OUR AVERAGE					
0.54±0.03±0.04	386	97 ABLIKIM	10A BES3	$e^+ e^- \rightarrow \psi(2S) \rightarrow \gamma\chi_{c2}$	
0.47±0.05±0.05	156 ± 14	ASNER	09 CLEO	$\psi(2S) \rightarrow \gamma\eta\eta$	
• • • We do not use the following data for averages, fits, limits, etc. • • •					
< 0.44	90	98 ADAMS	07 CLEO	$\psi(2S) \rightarrow \gamma\chi_{c2}$	
< 3	90	BAI	03C BES	$\psi(2S) \rightarrow \gamma\eta\eta \rightarrow 5\gamma$	
0.62±0.31±0.19		LEE	85 CBAL	$\psi(2S) \rightarrow \text{photons}$	
97 Calculated by us. ABLIKIM 10A reports $B(\chi_{c2} \rightarrow \eta\eta) = (0.65 \pm 0.04 \pm 0.05 \pm 0.03) \times 10^{-3}$ using $B(\psi(2S) \rightarrow \gamma\chi_{c2}) = (8.3 \pm 0.4)\%$.					
98 Superseded by ASNER 09.					

NODE=M057B04
NODE=M057B04

NODE=M057B04;LINKAGE=AB
NODE=M057B04;LINKAGE=AD

$$\Gamma(\chi_{c2}(1P) \rightarrow K^+K^-)/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))/\Gamma_{\text{total}}$$

$$\Gamma_{27}/\Gamma \times \Gamma_{120}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}$$

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
9.5±0.6 OUR FIT				
10.5±0.3±0.6	1.6k	99 ASNER	09 CLEO	$\psi(2S) \rightarrow \gamma K^+K^-$
99 Calculated by us. ASNER 09 reports $B(\chi_{c2} \rightarrow K^+K^-) = (1.13 \pm 0.03 \pm 0.06 \pm 0.07) \times 10^{-3}$ using $B(\psi(2S) \rightarrow \gamma\chi_{c2}) = (9.33 \pm 0.14 \pm 0.61)\%$.				

NODE=M057B03
NODE=M057B03

NODE=M057B03;LINKAGE=AS

$$\Gamma(\chi_{c2}(1P) \rightarrow K^+K^-)/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma\chi_{c2}(1P))/\Gamma(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-)$$

$$\Gamma_{27}/\Gamma \times \Gamma_{120}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}$$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
0.280±0.017 OUR FIT				
$[(0.283 \pm 0.017) \times 10^{-3}$ OUR 2012 FIT]				
0.190±0.034±0.019	115 ± 13	100 BAI	98I BES	$\psi(2S) \rightarrow \gamma K^+K^-$
100 Calculated by us. The value for $B(\chi_{c2} \rightarrow K^+K^-)$ reported by BAI 98I is derived using $B(\psi(2S) \rightarrow \gamma\chi_{c2}) = (7.8 \pm 0.8)\%$ and $B(\psi(2S) \rightarrow J/\psi\pi^+\pi^-) = (32.4 \pm 2.6)\%$ [BAI 98D].				

NODE=M057B8
NODE=M057B8
NEW

NODE=M057B;LINKAGE=BI

$$\Gamma(\chi_{c2}(1P) \rightarrow K_S^0 K_S^0)/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c2}(1P))/\Gamma_{\text{total}}$$

$$\Gamma_{28}/\Gamma \times \Gamma_{120}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}$$

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
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5.1 ±0.4 OUR FIT
5.0 ±0.4 OUR AVERAGE

4.9 ± 0.3 ± 0.3 373 ± 20 101 ASNER 09 CLEO $\psi(2S) \rightarrow \gamma K_S^0 K_S^0$
 5.72 ± 0.76 ± 0.63 65 ABLIKIM 050 BES2 $\psi(2S) \rightarrow \gamma K_S^0 K_S^0$
 101 Calculated by us. ASNER 09 reports $B(\chi_{c2} \rightarrow K_S^0 K_S^0) = (0.53 \pm 0.03 \pm 0.03 \pm 0.03) \times 10^{-3}$ using $B(\psi(2S) \rightarrow \gamma \chi_{c2}) = (9.33 \pm 0.14 \pm 0.61)\%$.

$$\Gamma(\chi_{c2}(1P) \rightarrow K_S^0 K_S^0)/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c2}(1P))/\Gamma(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-)$$

$$\Gamma_{28}/\Gamma \times \Gamma_{120}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}$$

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
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14.9±1.1 OUR FIT

$[(15.0 \pm 1.1) \times 10^{-5}$ OUR 2012 FIT]

14.7±4.1±3.3 102 BAI 99B BES $\psi(2S) \rightarrow \gamma K_S^0 K_S^0$

102 Calculated by us. The value of $B(\chi_{c2} \rightarrow K_S^0 K_S^0)$ reported by BAI 99B was derived using $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = (7.8 \pm 0.8)\%$ and $B(\psi(2S) \rightarrow J/\psi \pi^+ \pi^-) = (32.4 \pm 2.6)\%$ [BAI 98D].

$$\Gamma(\chi_{c2}(1P) \rightarrow \bar{K}^0 K^+ \pi^- + \text{c.c.})/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c2}(1P))/\Gamma_{\text{total}}$$

$$\Gamma_{29}/\Gamma \times \Gamma_{120}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}$$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
--------------------------	------	-------------	------	---------

1.22±0.17 OUR FIT
1.15±0.18 OUR AVERAGE

1.21 ± 0.19 ± 0.09 37 103 ATHAR 07 CLEO $\psi(2S) \rightarrow \gamma K_S^0 K^\pm \pi^\mp$
 0.97 ± 0.32 ± 0.13 28 104 ABLIKIM 06R BES2 $\psi(2S) \rightarrow \gamma K_S^0 K^\pm \pi^\mp$

103 Calculated by us. ATHAR 07 reports $B(\chi_{c2} \rightarrow \bar{K}^0 K^+ \pi^- + \text{c.c.}) = (1.3 \pm 0.2 \pm 0.1 \pm 0.1) \times 10^{-3}$ using $B(\psi(2S) \rightarrow \gamma \chi_{c2}) = (9.33 \pm 0.14 \pm 0.61)\%$.

104 Calculated by us. ABLIKIM 06R reports $B(\chi_{c2} \rightarrow K_S^0 K^\pm \pi^\mp) = (0.6 \pm 0.2 \pm 0.1) \times 10^{-3}$ using $B(\psi(2S) \rightarrow \gamma \chi_{c2}) = (8.1 \pm 0.6)\%$. We have multiplied by 2 to obtain $\bar{K}^0 K^+ \pi^- + \text{c.c.}$ from $K_S^0 K^\pm \pi^\mp$.

$$\Gamma(\chi_{c2}(1P) \rightarrow 2(\pi^+ \pi^-))/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c2}(1P))/\Gamma(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-)$$

$$\Gamma_1/\Gamma \times \Gamma_{120}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}$$

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
--------------------------	-------------	------	---------

2.84±0.27 OUR FIT

$[(2.86 \pm 0.27) \times 10^{-3}$ OUR 2012 FIT]

3.1 ±1.0 OUR AVERAGE Error includes scale factor of 2.5.

2.3 ± 0.1 ± 0.5 105 BAI 99B BES $\psi(2S) \rightarrow \gamma \chi_{c2}$
 4.3 ± 0.6 106 TANENBAUM 78 MRK1 $\psi(2S) \rightarrow \gamma \chi_{c2}$

105 Calculated by us. The value for $B(\chi_{c2} \rightarrow 2\pi^+ 2\pi^-)$ reported in BAI 99B is derived using $B(\psi(2S) \rightarrow \gamma \chi_{c2}) = (7.8 \pm 0.8)\%$ and $B(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-) = (32.4 \pm 2.6)\%$ [BAI 98D].

106 The value for $B(\psi(2S) \rightarrow \gamma \chi_{c2}) \times B(\chi_{c2} \rightarrow 2\pi^+ \pi^-)$ reported in TANENBAUM 78 is derived using $B(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-) \times B(J/\psi(1S) \ell^+ \ell^-) = (4.6 \pm 0.7)\%$. Calculated by us using $B(J/\psi(1S) \rightarrow \ell^+ \ell^-) = 0.1181 \pm 0.0020$.

$$\Gamma(\chi_{c2}(1P) \rightarrow K^+ K^- K^+ K^-)/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c2}(1P))/\Gamma_{\text{total}}$$

$$\Gamma_{36}/\Gamma \times \Gamma_{120}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}$$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
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1.56±0.19 OUR FIT

$[(1.55 \pm 0.19) \times 10^{-4}$ OUR 2012 FIT]

1.76±0.16±0.24 160 107 ABLIKIM 06T BES2 $\psi(2S) \rightarrow \gamma 2K^+ 2K^-$

107 Calculated by us. The value of $B(\chi_{c2} \rightarrow 2K^+ 2K^-)$ reported by ABLIKIM 06T was derived using $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = (8.1 \pm 0.4)\%$.

NODE=M057B12

NODE=M057B12

NODE=M057B12;LINKAGE=AS

NODE=M057B13

NODE=M057B13

NEW

NODE=M057B13;LINKAGE=BA

NODE=M057B05

NODE=M057B05

NODE=M057B05;LINKAGE=AT

NODE=M057B05;LINKAGE=AB

NODE=M057B5

NODE=M057B5

NEW

NODE=M057B;LINKAGE=K1

NODE=M057B;LINKAGE=K2

NODE=M057B14

NODE=M057B14

NEW

NODE=M057B14;LINKAGE=AB

$$\frac{\Gamma(\chi_{c2}(1P) \rightarrow K^+ K^- K^+ K^-)/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c2}(1P))}{\Gamma(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-)} / \frac{\Gamma_{36}/\Gamma \times \Gamma_{120}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}}$$

VALUE (units 10^{-4}) DOCUMENT ID TECN COMMENT

4.6±0.5 OUR FIT

$[(4.6 \pm 0.6) \times 10^{-4}$ OUR 2012 FIT]

3.6±0.6±0.6 108 BAI 99B BES $\psi(2S) \rightarrow \gamma 2K^+ 2K^-$

108 Calculated by us. The value of $B(\chi_{c2} \rightarrow 2K^+ 2K^-)$ reported by BAI 99B was derived using $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = (7.8 \pm 0.8)\%$ and $B(\psi(2S) \rightarrow J/\psi \pi^+ \pi^-) = (32.4 \pm 2.6)\%$ [BAI 98D].

$$\frac{\Gamma(\chi_{c2}(1P) \rightarrow \phi\phi)/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c2}(1P))/\Gamma_{\text{total}}}{\Gamma_{19}/\Gamma \times \Gamma_{120}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}}$$

VALUE (units 10^{-4}) EVTS DOCUMENT ID TECN COMMENT

1.01±0.08 OUR FIT

$[(1.00 \pm 0.10) \times 10^{-4}$ OUR 2012 FIT]

0.98±0.13 OUR AVERAGE Error includes scale factor of 1.3.

0.94±0.03±0.10	849	109 ABLIKIM	11K BES3	$\psi(2S) \rightarrow \gamma$ hadrons
1.38±0.24±0.23	41	110 ABLIKIM	06T BES2	$\psi(2S) \rightarrow \gamma 2K^+ 2K^-$

109 Calculated by us. The value of $B(\chi_{c2} \rightarrow \phi\phi)$ reported by ABLIKIM 11K was derived using $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = (8.74 \pm 0.35)\%$.

110 Calculated by us. The value of $B(\chi_{c2} \rightarrow \phi\phi)$ reported by ABLIKIM 06T was derived using $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = (8.1 \pm 0.4)\%$.

$$\frac{\Gamma(\chi_{c2}(1P) \rightarrow \phi\phi)/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c2}(1P))/\Gamma(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-)}{\Gamma_{19}/\Gamma \times \Gamma_{120}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}}$$

VALUE (units 10^{-4}) DOCUMENT ID TECN COMMENT

2.98±0.25 OUR FIT

$[(2.96 \pm 0.29) \times 10^{-4}$ OUR 2012 FIT]

4.8 ±1.3 ±1.3 111 BAI 99B BES $\psi(2S) \rightarrow \gamma 2K^+ 2K^-$

111 Calculated by us. The value of $B(\chi_{c2} \rightarrow \phi\phi)$ reported by BAI 99B was derived using $B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) = (7.8 \pm 0.8)\%$ and $B(\psi(2S) \rightarrow J/\psi \pi^+ \pi^-) = (32.4 \pm 2.6)\%$ [BAI 98D].

$$\frac{\Gamma(\chi_{c2}(1P) \rightarrow \gamma J/\psi(1S))/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c2}(1P))/\Gamma_{\text{total}}}{\Gamma_{59}/\Gamma \times \Gamma_{120}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}}$$

VALUE (units 10^{-2}) EVTS DOCUMENT ID TECN COMMENT

1.74 ±0.04 OUR FIT

$[(1.70 \pm 0.04) \times 10^{-2}$ OUR 2012 FIT]

1.52 ±0.15 OUR AVERAGE Error includes scale factor of 2.6. See the ideogram below.

$[(1.34 \pm 0.14) \times 10^{-2}$ OUR 2012 AVERAGE Scale factor = 1.9]

1.874±0.007±0.102	76k	ABLIKIM	120 BES3	$\psi(2S) \rightarrow \gamma \chi_{c2}$
1.62 ±0.04 ±0.12	5.8k	BAI	04I BES2	$\psi(2S) \rightarrow J/\psi \gamma \gamma$
0.99 ±0.10 ±0.08		GAISER	86 CBAL	$\psi(2S) \rightarrow \gamma X$
1.47 ±0.17		112 OREGLIA	82 CBAL	$\psi(2S) \rightarrow \gamma \chi_{c2}$
1.8 ±0.5		113 BRANDELIK	79B DASP	$\psi(2S) \rightarrow \gamma \chi_{c2}$
1.2 ±0.2		113 BARTEL	78B CNTR	$\psi(2S) \rightarrow \gamma \chi_{c2}$
2.2 ±1.2		114 BIDDICK	77 CNTR	$e^+ e^- \rightarrow \gamma X$
1.2 ±0.7		112 WHITAKER	76 MRK1	$e^+ e^- \rightarrow \gamma X$

• • • We do not use the following data for averages, fits, limits, etc. • • •

1.95 ±0.02 ±0.07	12.4k	115 MENDEZ	08 CLEO	$\psi(2S) \rightarrow \gamma \chi_{c2}$
1.85 ±0.04 ±0.07	1.9k	116 ADAM	05A CLEO	Repl. by MENDEZ 08

112 Recalculated by us using $B(J/\psi(1S) \rightarrow \ell^+ \ell^-) = 0.1181 \pm 0.0020$.

113 Recalculated by us using $B(J/\psi(1S) \rightarrow \mu^+ \mu^-) = 0.0588 \pm 0.0010$.

114 Assumes isotropic gamma distribution.

115 Not independent from other measurements of MENDEZ 08.

116 Not independent from other values reported by ADAM 05A.

NODE=M057B15

NODE=M057B15

NEW

NODE=M057B15;LINKAGE=BA

NODE=M057B16

NODE=M057B16

NEW

NODE=M057B16;LINKAGE=AL

NODE=M057B16;LINKAGE=AB

NODE=M057B17

NODE=M057B17

NEW

NODE=M057B17;LINKAGE=BA

NODE=M057B2

NODE=M057B2

NEW

NEW

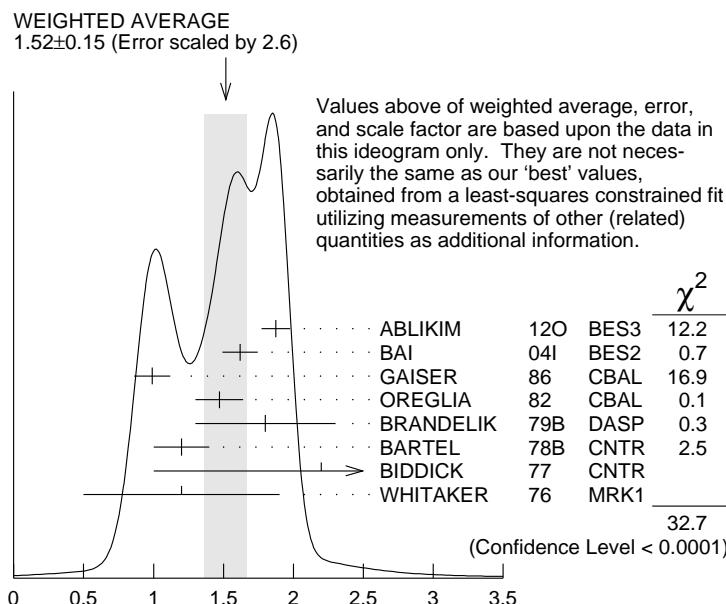
NODE=M057B;LINKAGE=3Q

NODE=M057B;LINKAGE=2Q

NODE=M057B;LINKAGE=EA

NODE=M057B2;LINKAGE=ME

NODE=M057B;LINKAGE=AD



$$\Gamma(\chi_{c2}(1P) \rightarrow \gamma J/\psi(1S)) / \Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) / \Gamma_{\text{total}} (\text{units } 10^{-2})$$

$$\Gamma(\chi_{c2}(1P) \rightarrow \gamma J/\psi(1S)) / \Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) / \Gamma(\psi(2S) \rightarrow J/\psi(1S) \text{anything})$$

$$\begin{aligned} \Gamma_{59}/\Gamma \times \Gamma_{120}^{\psi(2S)}/\Gamma_9^{\psi(2S)} = \Gamma_{59}/\Gamma \times \Gamma_{120}^{\psi(2S)} / (\Gamma_{11}^{\psi(2S)} + \Gamma_{12}^{\psi(2S)} + \Gamma_{13}^{\psi(2S)} + \\ 0.348\Gamma_{119}^{\psi(2S)} + 0.198\Gamma_{120}^{\psi(2S)}) \end{aligned}$$

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
2.88±0.07 OUR FIT				

$[(2.86 \pm 0.07) \times 10^{-2}$ OUR 2012 FIT]

• • • We do not use the following data for averages, fits, limits, etc. • • •

3.12±0.03±0.09	12.4k	117 MENDEZ	08 CLEO	$\psi(2S) \rightarrow \gamma \chi_{c2}$
3.11±0.07±0.07	1.9k	ADAM	05A CLEO	Repl. by MENDEZ 08

117 Not independent from other measurements of MENDEZ 08.

NODE=M057B7

NODE=M057B7

NODE=M057B7

NEW

NODE=M057B7;LINKAGE=ME

$$\Gamma(\chi_{c2}(1P) \rightarrow \gamma J/\psi(1S)) / \Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) / \Gamma(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-)$$

$$\Gamma_{59}/\Gamma \times \Gamma_{120}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}$$

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
5.10±0.12 OUR FIT				

$[(5.07 \pm 0.13) \times 10^{-2}$ OUR 2012 FIT]

5.53±0.17 OUR AVERAGE

5.56±0.05±0.16	12.4k	MENDEZ	08 CLEO	$\psi(2S) \rightarrow \gamma \chi_{c2}$
6.0 ± 2.8	1.3k	118 ABLIKIM	04B BES	$\psi(2S) \rightarrow J/\psi X$
3.9 ± 1.2		119 HIMEL	80 MRK2	$\psi(2S) \rightarrow \gamma \chi_{c2}$

• • • We do not use the following data for averages, fits, limits, etc. • • •

5.52±0.13±0.13	1.9k	120 ADAM	05A CLEO	Repl. by MENDEZ 08
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118 From a fit to the J/ψ recoil mass spectra.

119 The value for $B(\psi(2S) \rightarrow \gamma \chi_{c2}) \times B(\chi_{c2} \rightarrow \gamma J/\psi(1S))$ reported in HIMEL 80 is derived using $B(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-) = (33 \pm 3)\%$ and $B(J/\psi(1S) \rightarrow \ell^+ \ell^-) = 0.138 \pm 0.018$. Calculated by us using $B(J/\psi(1S) \rightarrow \ell^+ \ell^-) = (0.1181 \pm 0.0020)$.

120 Not independent from other values reported by ADAM 05A.

NODE=M057B3

NODE=M057B3

NEW

NODE=M057B;LINKAGE=AB

NODE=M057B;LINKAGE=H8

NODE=M057B3;LINKAGE=AD

$$\Gamma(\chi_{c2}(1P) \rightarrow \gamma \gamma) / \Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c2}(1P)) / \Gamma_{\text{total}}$$

$$\Gamma_{63}/\Gamma \times \Gamma_{120}^{\psi(2S)}/\Gamma^{\psi(2S)}$$

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
2.28±0.16 OUR FIT				

$[(2.26 \pm 0.16) \times 10^{-5}$ OUR 2012 FIT]

2.73±0.32 OUR AVERAGE

2.68±0.28±0.15	333 ± 35	ECKLUND	08A CLEO	$\psi(2S) \rightarrow \gamma \chi_{c2} \rightarrow 3\gamma$
7.0 ± 2.1 ± 2.0		LEE	85 CBAL	$\psi(2S) \rightarrow \gamma \chi_{c2}$

NODE=M057B4

NODE=M057B4

NEW

MULTIPOLE AMPLITUDES IN $\chi_{c2}(1P) \rightarrow \gamma J/\psi(1S)$ RADIATIVE DECAY

$a_2 = M2/\sqrt{E1^2 + M2^2 + E3^2}$ Magnetic quadrupole fractional transition amplitude

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
-10.0 ± 1.5 OUR AVERAGE				
- 9.3 ± 1.6 ± 0.3	19.8k	121 ARTUSO 09	CLEO	$\psi(2S) \rightarrow \gamma\gamma\ell^+\ell^-$
- 9.3 ± 3.9 ± 0.6	5.9k	122 AMBROGIANI 02	E835	$p\bar{p} \rightarrow \chi_{c2} \rightarrow J/\psi\gamma$
- 14 ± 6	1.9k	122 ARMSTRONG 93E	E760	$p\bar{p} \rightarrow \chi_{c2} \rightarrow J/\psi\gamma$
-33.3 ± 11.6 -29.2	441	122 OREGLIA 82	CBAL	$\psi(2S) \rightarrow \chi_{c1}\gamma \rightarrow J/\psi\gamma\gamma$

• • • We do not use the following data for averages, fits, limits, etc. • • •

- 7.9 ± 1.9 ± 0.3	19.8k	123 ARTUSO 09	CLEO	$\psi(2S) \rightarrow \gamma\gamma\ell^+\ell^-$
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121 From a fit with floating $M2$ amplitudes a_2 and b_2 , and fixed $E3$ amplitudes $a_3=b_3=0$.
 122 Assuming $a_3=0$.

123 From a fit with floating $M2$ and $E3$ amplitudes a_2 , b_2 , and a_3 , and b_3 .

$a_3 = E3/\sqrt{E1^2 + M2^2 + E3^2}$ Electric octupole fractional transition amplitude

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
1.6 ± 1.3 OUR AVERAGE				
1.7 ± 1.4 ± 0.3	19.8k	124 ARTUSO 09	CLEO	$\psi(2S) \rightarrow \gamma\gamma\ell^+\ell^-$
2.0 ± 5.5 - 4.4 ± 0.9	5908	AMBROGIANI 02	E835	$p\bar{p} \rightarrow \chi_{c2} \rightarrow J/\psi\gamma$
0 ± 6 - 5	1904	ARMSTRONG 93E	E760	$p\bar{p} \rightarrow \chi_{c2} \rightarrow J/\psi\gamma$

124 From a fit with floating $M2$ and $E3$ amplitudes a_2 , b_2 , and a_3 , and b_3 .

MULTIPOLE AMPLITUDES IN $\psi(2S) \rightarrow \gamma\chi_{c2}(1P)$ RADIATIVE DECAY

$b_2 = M2/\sqrt{E1^2 + M2^2 + E3^2}$ Magnetic quadrupole fractional transition amplitude

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
2.2 ± 1.8 OUR AVERAGE Error includes scale factor of 1.7. See the ideogram below.				
4.6 ± 1.0 ± 1.3	13.8k	125 ABLIKIM 11I	BES3	$\psi(2S) \rightarrow \gamma\pi^+\pi^-, \gamma K^+K^-$
0.2 ± 1.5 ± 0.4	19.8k	126 ARTUSO 09	CLEO	$\psi(2S) \rightarrow \gamma\gamma\ell^+\ell^-$
- 5.1 ± 5.4 - 3.6	721	125 ABLIKIM 04I	BES2	$\psi(2S) \rightarrow \gamma\pi^+\pi^-, \gamma K^+K^-$
13.2 ± 9.8 - 7.5	441	127 OREGLIA 82	CBAL	$\psi(2S) \rightarrow \gamma\gamma\ell^+\ell^-$

• • • We do not use the following data for averages, fits, limits, etc. • • •

1.0 ± 1.3 ± 0.3	19.8k	127 ARTUSO 09	CLEO	$\psi(2S) \rightarrow \gamma\gamma\ell^+\ell^-$
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125 From a fit with floating $M2$ and $E3$ amplitudes b_2 and b_3 .

126 From a fit with floating $M2$ and $E3$ amplitudes a_2 , b_2 , and a_3 , and b_3 .

127 From a fit with floating $M2$ amplitudes a_2 and b_2 , and fixed $E3$ amplitudes $a_3=b_3=0$.

NODE=M057240

NODE=M057A1

NODE=M057A1

OCCUR=2

NODE=M057A1;LINKAGE=AR

NODE=M057A1;LINKAGE=A

NODE=M057A1;LINKAGE=AT

NODE=M057A2

NODE=M057A2

NODE=M057A2;LINKAGE=AR

NODE=M057250

NODE=M057QB2

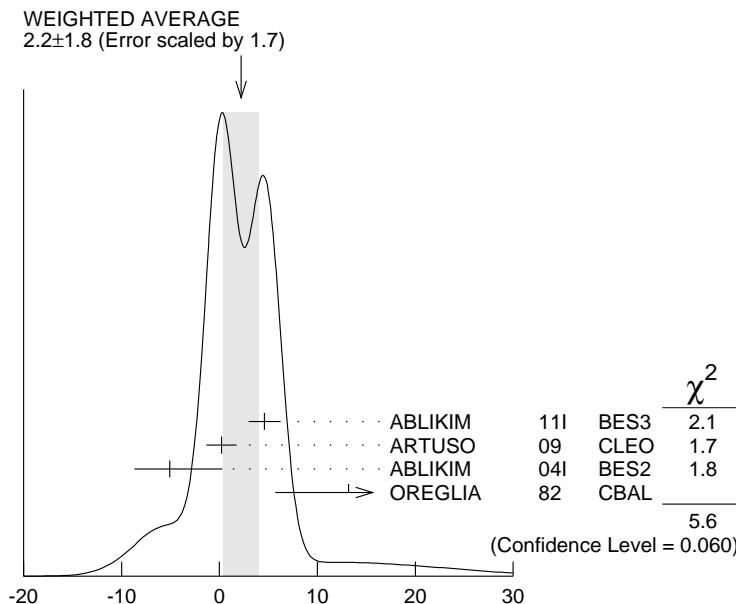
NODE=M057QB2

OCCUR=2

NODE=M057QB2;LINKAGE=AB

NODE=M057QB2;LINKAGE=AT

NODE=M057QB2;LINKAGE=AR



$b_2 = M2/\sqrt{E1^2 + M2^2 + E3^2}$ Magnetic quadrupole fractional transition amplitude (units 10^{-2})

$b_3 = E3/\sqrt{E1^2 + M2^2 + E3^2}$ Electric octupole fractional transition amplitude

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
-0.3±1.0 OUR AVERAGE				
1.5±0.8±1.8	13.8k	128	ABLIKIM	11I BES3 $\psi(2S) \rightarrow \gamma\pi^+\pi^-, \gamma K^+K^-$
-0.8±1.2±0.2	19.8k		ARTUSO	09 CLEO $\psi(2S) \rightarrow \gamma\gamma\ell^+\ell^-$
-2.7 ^{+4.3} _{-2.9}	721	128	ABLIKIM	04I BES2 $\psi(2S) \rightarrow \gamma\pi^+\pi^-, \gamma K^+K^-$

128 From a fit with floating $M2$ and $E3$ amplitudes b_2 and b_3 .

MULTIPOLE AMPLITUDE RATIOS IN RADIATIVE DECAYS

$\psi(2S) \rightarrow \gamma\chi_{c2}(1P)$ and $\chi_{c2} \rightarrow \gamma J/\psi(1S)$

b_2/a_2 Magnetic quadrupole transition amplitude ratio

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
-11 ⁺¹⁴ ₋₁₅	19.8k	129	ARTUSO	09 CLEO $\psi(2S) \rightarrow \gamma\gamma\ell^+\ell^-$

129 Statistical and systematic errors combined. From a fit with floating $M2$ amplitudes a_2 and b_2 , and fixed $E3$ amplitudes $a_3=b_3=0$. Not independent of values for $a_2(\chi_{c2}(1P))$ and $b_2(\chi_{c2}(1P))$ from ARTUSO 09.

$\chi_{c2}(1P)$ REFERENCES

ABLIKIM	13D	PR D87 012007	M. Ablikim <i>et al.</i>	(BES III Collab.)
ABLIKIM	120	PRL 109 172002	M. Ablikim <i>et al.</i>	(BES III Collab.)
LEES	12AE	PR D86 092005	J.P. Lees <i>et al.</i>	(BABAR Collab.)
LIU	12B	PRL 108 232001	Z.Q. Liu <i>et al.</i>	(BELLE Colab.)
ABLIKIM	11A	PR D83 012006	M. Ablikim <i>et al.</i>	(BES III Collab.)
ABLIKIM	11E	PR D83 112005	M. Ablikim <i>et al.</i>	(BES III Collab.)
ABLIKIM	11F	PR D83 112009	M. Ablikim <i>et al.</i>	(BES III Collab.)
ABLIKIM	11I	PR D84 092006	M. Ablikim <i>et al.</i>	(BES III Collab.)
ABLIKIM	11K	PRL 107 092001	M. Ablikim <i>et al.</i>	(BES III Collab.)
DEL-AMO-SA... ONIYISI	11M	PR D84 012004	P. del Amo Sanchez <i>et al.</i>	(BABAR Collab.)
ABLIKIM	10A	PR D81 052005	M. Ablikim <i>et al.</i>	(BES III Collab.)
ONIYISI	10	PR D82 011103	P.U.E. Oniyisi <i>et al.</i>	(CLEO Collab.)
UEHARA	10A	PR D82 114031	S. Uehara <i>et al.</i>	(BELLE Collab.)
ARTUSO	09	PR D80 112003	M. Artuso <i>et al.</i>	(CLEO Collab.)
ASNER	09	PR D79 072007	D.M. Asner <i>et al.</i>	(CLEO Collab.)
UEHARA	09	PR D79 052009	S. Uehara <i>et al.</i>	(BELLE Collab.)
BENNETT	08A	PRL 101 151801	J.V. Bennett <i>et al.</i>	(CLEO Collab.)
ECKLUND	08A	PR D78 091501	K.M. Ecklund <i>et al.</i>	(CLEO Collab.)
HE	08B	PR D78 092004	Q. He <i>et al.</i>	(CLEO Collab.)
MENDEZ	08	PR D78 011102	H. Mendez <i>et al.</i>	(CLEO Collab.)
NAIK	08	PR D78 031101	P. Naik <i>et al.</i>	(CLEO Collab.)
UEHARA	08	EPJ C53 1	S. Uehara <i>et al.</i>	(BELLE Collab.)
ADAMS	07	PR D75 071101	G.S. Adams <i>et al.</i>	(CLEO Collab.)
ATHAR	07	PR D75 032002	S.B. Athar <i>et al.</i>	(CLEO Collab.)
CHEN	07B	PL B651 15	W.T. Chen <i>et al.</i>	(BELLE Collab.)
ABLIKIM	06D	PR D73 052006	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	06I	PR D74 012004	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	06R	PR D74 072001	M. Ablikim <i>et al.</i>	(BES Collab.)

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ABLIKIM	06T	PL B642 197	M. Ablikim <i>et al.</i>	(BES Collab.)	REFID=51453
DOBBS	06	PR D73 071101	S. Dobbs <i>et al.</i>	(CLEO Collab.)	REFID=51062
ABLIKIM	05G	PR D71 092002	M. Ablikim <i>et al.</i>	(BES Collab.)	REFID=50756
ABLIKIM	05N	PL B630 7	M. Ablikim <i>et al.</i>	(BES Collab.)	REFID=50847
ABLIKIM	05O	PL B630 21	M. Ablikim <i>et al.</i>	(BES Collab.)	REFID=50846
ADAM	05A	PRL 94 232002	N.E. Adam <i>et al.</i>	(CLEO Collab.)	REFID=50763
ANDREOTTI	05A	NP B717 34	M. Andreotti <i>et al.</i>	(FNAL E835 Collab.)	REFID=50769
NAKAZAWA	05	PL B615 39	H. Nakazawa <i>et al.</i>	(BELLE Collab.)	REFID=50807
ABLIKIM	04B	PR D70 012003	M. Ablikim <i>et al.</i>	(BES Collab.)	REFID=49741
ABLIKIM	04H	PR D70 092003	M. Ablikim <i>et al.</i>	(BES Collab.)	REFID=50188
ABLIKIM	04I	PR D70 092004	M. Ablikim <i>et al.</i>	(BES Collab.)	REFID=50189
ATHAR	04	PR D70 112002	S.B. Athar <i>et al.</i>	(CLEO Collab.)	REFID=50331
BAI	04F	PR D69 092001	J.Z. Bai <i>et al.</i>	(BES Collab.)	REFID=49752
BAI	04I	PR D70 012006	J.Z. Bai <i>et al.</i>	(BES Collab.)	REFID=49755
AULCHENKO	03	PL B573 63	V.M. Aulchenko <i>et al.</i>	(KEDR Collab.)	REFID=49579
BAI	03C	PR D67 032004	J.Z. Bai <i>et al.</i>	(BES Collab.)	REFID=49190
BAI	03E	PR D67 112001	J.Z. Bai <i>et al.</i>	(BES Collab.)	REFID=49416
ABE	02T	PL B540 33	K. Abe <i>et al.</i>	(BELLE Collab.)	REFID=48813
AMBROGIANI	02	PR D65 052002	M. Ambrogiani <i>et al.</i>	(FNAL E835 Collab.)	REFID=48552
EISENSTEIN	01	PRL 87 061801	B.I. Eisenstein <i>et al.</i>	(CLEO Collab.)	REFID=48344
AMBROGIANI	00B	PR D62 052002	M. Ambrogiani <i>et al.</i>	(FNAL E835 Collab.)	REFID=47940
ACCIARRI	99E	PL B453 73	M. Acciarri <i>et al.</i>	(L3 Collab.)	REFID=46943
BAI	99B	PR D60 072001	J.Z. Bai <i>et al.</i>	(BES Collab.)	REFID=47385
ACKER..K...	98	PL B439 197	K. Ackerstaff <i>et al.</i>	(OPAL Collab.)	REFID=46324
BAI	98D	PR D58 092006	J.Z. Bai <i>et al.</i>	(BES Collab.)	REFID=46338
BAI	98I	PRL 81 3091	J.Z. Bai <i>et al.</i>	(BES Collab.)	REFID=46343
DOMINICK	94	PR D50 4265	J. Dominick <i>et al.</i>	(CLEO Collab.)	REFID=44077
ARMSTRONG	93	PRL 70 2988	T.A. Armstrong <i>et al.</i>	(FNAL E760 Collab.)	REFID=43306
ARMSTRONG	93E	PR D48 3037	T.A. Armstrong <i>et al.</i>	(FNAL-E760 Collab.)	REFID=48616
BAUER	93	PL B302 345	D.A. Bauer <i>et al.</i>	(TPC Collab.)	REFID=43315
ARMSTRONG	92	NP B373 35	T.A. Armstrong <i>et al.</i>	(FNAL, FERR, GENO+)	REFID=41865
Also		PRL 68 1468	T.A. Armstrong <i>et al.</i>	(FNAL, FERR, GENO+)	REFID=41907
BAGLIN	87B	PL B187 191	C. Baglin <i>et al.</i>	(R704 Collab.)	REFID=40018
BAGLIN	86B	PL B172 455	C. Baglin <i>et al.</i>	(LAPP, CERN, GENO, LYON, OSLO+)	REFID=22145
GAISER	86	PR D34 711	J. Gaisser <i>et al.</i>	(Crystal Ball Collab.)	REFID=22012
LEE	85	SLAC 282	R.A. Lee	(SLAC)	REFID=40589
LEMOIGNE	82	PL 113B 509	Y. Lemoigne <i>et al.</i>	(SACL, LOIC, SHMP+)	REFID=22084
OREGLIA	82	PR D25 2259	M.J. Oreglia <i>et al.</i>	(SLAC, CIT, HARV+)	REFID=22120
Also		Private Comm.	M.J. Oreglia	(IFI)	REFID=22143
BARATE	81	PR D24 2994	R. Barate <i>et al.</i>	(SACL, LOIC, SHMP, CERN+)	REFID=22164
HIMEL	80	PRL 44 920	T. Himel <i>et al.</i>	(LBL, SLAC)	REFID=22119
Also		Private Comm.	G. Trilling	(LBL, UCB)	REFID=22113
BRANDELIK	79B	NP B160 426	R. Brandelik <i>et al.</i>	(DASP Collab.)	REFID=22115
BARTEL	78B	PL 79B 492	W. Bartel <i>et al.</i>	(DESY, HEIDP)	REFID=22111
TANENBAUM	78	PR D17 1731	W.M. Tanenbaum <i>et al.</i>	(SLAC, LBL)	REFID=22112
Also		Private Comm.	G. Trilling	(LBL, UCB)	REFID=22113
BIDDICK	77	PRL 38 1324	C.J. Biddick <i>et al.</i>	(UCSD, UMD, PAVI+)	REFID=22059
WHITAKER	76	PRL 37 1596	J.S. Whitaker <i>et al.</i>	(SLAC, LBL)	REFID=22151